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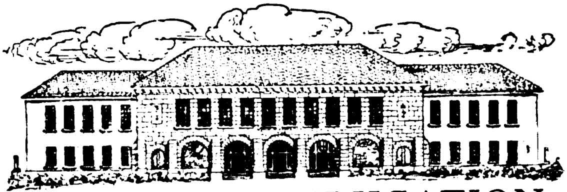

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SILENT READING:
A STUDY OF THE VARIOUS TYPES

By
CHARLES HUBBARD JUDD
and
GUY THOMAS BUSWELL

THE UNIVERSITY OF CHICAGO
CHICAGO, ILLINOIS

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CHAPTER I

INTRODUCTION

No more striking example of the effect of scientific studies on school practice can be found than the present-day attention to the teaching of silent reading. A score of books have been published in the last three years which explicitly state that their chief aim is to contribute to the methods of teaching silent reading. Some teachers and principals are so inspired with enthusiasm for silent reading that they are advocating the abandonment altogether of oral reading, although oral reading is more strongly intrenched in the traditions of the schools than any other subject or method of teaching.

The discovery of silent reading is directly traceable to the work of educational psychologists. At a time when practical school procedure was ignoring entirely the distinction between oral reading and silent reading, laboratory studies began to make certain measurements which are the basis of the present-day reform. It was found by means of simple time-measurements that a skilful reader reads silently several times as fast as he reads aloud. Later it was shown by more elaborate methods why this is so. The element which makes oral reading slow is the relatively cumbersome process of pronouncing the words. This process cannot by any possible device be speeded up so as to equal in rapidity the processes of recognition and interpretation in the highly perfected form which these reach in a mature reader. A very common result of emphasis on oral reading during the whole school training is to fasten upon the pupil the limitations which are characteristic of oral reading. Recent investigations of the laboratory have made this clear by showing that the kind of reading exhibited by adults who are inefficient readers is usually the same as the kind of reading found in the case of immature readers who are at the early oral stages.

While scientific workers were making these discoveries, the schools continued to overlook the distinction between oral reading and silent reading. Throughout the elementary curriculum it was the practice to limit teaching of reading to class exercises in which the method was exclusively oral. To be sure, the teachers made the demand, especially from the fourth grade on, that pupils do much reading by themselves. Lessons were assigned in geography and history and other subjects which required the independent mastery of textbooks, but no effort was made to supervise the pupils' reading habits during their perusal of these textbooks. It was assumed that a pupil could read silently with efficiency because he was reading orally in the formal reading class.

Scientific evidence in regard to the difference between oral reading and silent reading accumulated, however, until it became too impressive to be ignored. Not only so, but as soon as the distinction was clearly pointed out, practical school people began to realize that many of the troubles of the upper grades can be traced directly to the failure to give proper recognition to silent reading. The demand for a reform began to be voiced in many quarters and finally led to one of the most significant movements in modern education.

The general lesson to be drawn from the recent history of reading in the schools can be stated in a form which is very encouraging to the student of educational science. This lesson is that wherever the mental processes of pupils show fundamental differences, practical school procedure will have to fit its methods to these differences. If the mental processes involved in reading silently are different from the mental processes involved in reading aloud, the school will have to meet this difference with special methods. The program of co-operation between science and practical teaching is easy to lay out when we thus see the intimate relation between methods and psychological distinctions. The duty of the scientist is to devise methods of discovering and describing fundamental distinctions. The duty of the teacher is to develop practical ways of dealing with the various kinds of mental processes which are pointed out.

This monograph is a study of some of the more complex forms of reading. In the main, the types of reading dealt with are those which are usually carried on silently. For purposes of investigation it is sometimes desirable to require the subject to read orally some part of the exercise, but in such cases the oral reading is used primarily to check the silent reading. The real center of the investigation is silent reading.

The practical purpose of such an inquiry is to contribute those distinctions which will be suggestive to teachers who are trying to develop methods of supervising and teaching habits of effective silent reading. During the last few years it has become very evident that it is by no means as easy to teach silent reading as to teach oral reading. The symptoms of success or failure in the latter field are open to direct observation. In silent reading, on the other hand, the observable facts are relatively few and extremely difficult to interpret. This obscurity of the symptoms of silent reading makes it doubly desirable that scientific methods be developed which will direct the attention of teachers to every discoverable indication of the character of the silent-reading process. The methods employed in discovering these indications may not be of a kind which teachers can use directly, but the results will be helpful in guiding practical observation and teaching.

The methods of the present inquiry are the complicated methods of the laboratory. By means of apparatus which has been fully described in an earlier study,[1] the eye-movements of a large number of pupils were photographed, and their habits of looking at the contents of the printed page were studied through comparisons of the resulting photographs.

It will, perhaps, make the later discussions easier to follow if the general psychological principles which issue from this study are briefly illustrated. To this end we may describe some of the typical results from the studies to be reported in the later pages of this monograph.

It is found that a pupil makes eye-movements which are different when he is asked, on the one hand, to read a passage with special attention to certain grammatical questions which he is to answer and when, on the other hand, he is asked to repeat the passage word for word at the conclusion of the reading. The characteristically different eye-movements which appear in these two cases make it quite certain that the demand for grammatical analysis and the demand for reproduction word for word cannot be fully met by the pupil through one and the same kind of attention. While he is attending to grammar, he is in one frame of mind, and he makes one kind of attack on the printed page. While he is reading for the purpose of reproducing verbatim, he is in a different attitude.

There is a popular psychology which assumes in a vague way that reading is the recognition of words and that all recognition of words is very much the same, whatever the conditions under which recognition takes place. This popular psychology, if it formulated itself, would say that there is stored somewhere in the mind a something which may be called the interpretation of a word. This interpretation is sometimes called a mental image. When the reader opens his eyes and sees the written or printed word, the interpretation or mental image is supposed to be drawn out of its pigeonhole and tied, by what the older psychologists called an association, and by what some recent writers have called a bond, to the impression received. The visual impression and the interpretation thus bound together by some kind of link are supposed to make up a unit or element of mental life. The business of the teacher is considered by this simple-minded type of psychology to be the business of tying up impressions with mental images. The mind is thought of as a kind of storehouse in which many hundreds or thousands of such linked couples are deposited.

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[1] Clarence Truman Gray, *Types of Reading Ability as Exhibited through Tests and Laboratory Experiments*, Supplementary Educational Monographs, Vol. I, No. 5, pp. 83–91. Chicago: University of Chicago, 1917.

Thus, there are teachers who feel that they can teach a word in a single lesson. They write a word on the blackboard and tell the pupil by definition what it means. They forget that in real life the word will always turn up as part of a sentence and that it will have a peculiar shade of meaning through its contrast with other words or through its special relation in the total idea conveyed by the sentence. The notion that a word and its meaning are two fixed pieces of experience which can be tied together is a purely mechanical theory and not adequate as a basis for real teaching.

The simple mechanical explanation just outlined is very satisfying to some minds, because it reduces all teaching to the same formula. There is nothing distracting about the instructor's problem if one has this straightforward, uncomplicated creed. One can teach little children and big children in the same way. All one has to do is to set up more and more combinations and strengthen them through repetition.

The type of popular psychology described in the foregoing paragraphs finds very little support in analytical studies such as the present monograph reports. A printed page turns out to be, as shown by this study, a source of a mass of impressions which the active mind begins to organize and arrange with reference to some pattern which it is trained to work out. If the mind is fitting together the impressions so as to bring into high relief grammatical distinctions, the grouping of words and the distribution of emphasis will be according to one pattern. If the mind is intent on something wholly different from grammar, as, for example, the experiences which the author is trying to picture, the whole mental and physical attitude of the reader will be very different.

Perhaps the most striking example which can be anticipated from the later results is the example of Latin teaching. Pupils in the third year of Latin do not read the words which are offered to them. The obvious fact shown by their eye-movements is that they do not even remotely approach the reading attitude. It is as inappropriate to speak of reading in describing what Latin students do in the high school as it would be to use the word "flying" in describing what people do when they walk. The whole nervous and muscular mechanism involved in flying is different from the nervous and muscular mechanism involved in walking.

It is entirely thinkable, of course, that the purpose of Latin teaching is something other than to teach pupils to read the text. In that case such investigations as those reported in the following pages will be useful in that they will help everybody to arrive at a knowledge of the mental pattern or attitude which is in reality cultivated in Latin classes. At the present time there is a great deal of vagueness about the matter because of the prevalence of the popular type of psychology discussed in earlier paragraphs. Given a printed book, a pair of eyes, an active brain, and it is assumed that whatever associations are being set up must be of the same general type as those set up when a book printed in the vernacular is similarly held before eyes and an active brain. The fact is that a great variety of results can issue from the coming together of books, eyes, and brains; some are useful and some are worse than useless; some develop personality and some pervert human energy. The business of the student of educational science is to discover the various ways in which impressions can be organized, to bring to the practical teacher such fundamental distinctions as he can discover, and to co-operate in this way in promoting the adoption of the best possible educational methods. The grammatical attitude is not the same as the attitude of reading for understanding a scene; nor are the grammatical attitude and the drama attitude interchangeable parts of a single mental complex. The vocabulary-translation attitude of the high-school pupil who is studying Latin is not the same as the attitude of one who is absorbed in the appreciation of a literary masterpiece. Mental life is a complex of organized attitudes, not a collection of mechanical associations or bonds.

One final introductory comment may be added in order to describe more fully the purposes of this monograph. It reports an effort to carry experimental analysis of school processes into the domain of the upper grades and the high school. It was entirely natural that laboratory studies of school processes should deal at first with the problems of elementary instruction. It is entirely understandable that high-school teachers have exhibited only a moderate interest in much of the work that has been done in educational science. The altogether obvious reasons why high schools have been aloof from the general scientific movement in education cannot, however, be accepted much longer by high-school teachers as justification for failure to apply scientific methods to the solution of their problems. The fact is that the complex processes which appear in the later stages of school training furnish the most inviting opportunities for scientific analysis. The experience of the last few years has demonstrated in striking fashion the possibility of vastly improving teaching through minute analyses which break up elementary subjects which have long been taught by uniform procedures at different levels, into numerous, distinguishable, special aspects of school work. It is legitimate to expect that analyses will be equally useful in improving high-school methods. If there are failures in algebra and geometry, the problem of education is to find out why the failures occur, and to discover the points at which more effective methods can be applied. There is need of training in methods of silent reading of science material, and there is need of a different type of training in the silent reading of literature. Even a superficial consideration of these two kinds of silent reading will convince the thoughtful teacher that he ought at least to inquire whether the methods in the one case apply also to the other. Thus, it is seen that the manifoldness of instruction at the high-school level brings with it the demand for more extended analyses than at any point lower down in the schools.

This monograph lays its chief emphasis on facts and conclusions which ought to be influential in affecting the teaching of the upper grades and of the high school.

CHAPTER II

ADJUSTMENTS IN READING TO CHANGES IN THE CONTENT OF PASSAGES

One of the statements very commonly made about passages which are assigned to be read is that they are easy or difficult. Such a statement may refer to a variety of characteristics. One type of difficult passage is made up of long words or unfamiliar words; the seat of the difficulty in such cases is the vocabulary. In other cases it may be the sentence structure which is complex or drawn out to such an extent that it taxes the reader's attention. Again, the logic of a discussion may be difficult to follow; the reader will in such a case, perhaps, know all of the words and be able to follow the sentence structure, but will have difficulty with the thought.

As a first step in the analysis of the mental processes which are involved in reading difficult passages, photographs were taken of the eye-movements of ten pupils in the fifth grade while they were reading Paragraphs 4, 6, 8, 10, and 12 from Gray's Standardized Reading Paragraphs. This gave fifty records for comparative study. The paragraphs are carefully standardized to measure oral reading and are known in their own field to be of equal steps of increasing difficulty. Difficulty is not here analyzed into its elements. As a matter of fact, there are changes in vocabulary, in length of sentences, and in complexity of logic. It should be noted that the paragraphs are not standardized for the type of reading for which they were used in this experiment, namely, silent reading.

The purpose of this first inquiry was to find out what a pupil does when he is confronted with a series of passages which can be described in general terms as increasingly difficult. Before the general table of results is presented, it will be well to discuss in detail the records of several individuals and their methods of dealing with the types of increasing difficulty found in these paragraphs.

Table I shows the facts for Subject D.S. It will be noted that there are two ways in which this subject meets difficulties. Either he makes more fixations per line or he increases the average length of his fixation pauses. If we compare Paragraph 6 with Paragraph 4, we see that the chief change is in the number of fixations. If we compare Paragraph 8 with Paragraph 6, we see that the major adjustment is in the length of the fixation pauses.

The psychological process which is going on when the number of fixation pauses increases is clearly shown in the column in Table I which records the average number of words read per fixation. The amount of material which is recognized in a single fixation becomes smaller with increasing difficulty. The pupil has to take in such a word as "philosophers" or "statisticians" in two or more fixations, while the words "it is better," which appear in an easy passage, are taken in at a single glance.

TABLE I*

RECORD OF SUBJECT D.S. IN SILENT READING OF PARAGRAPHS OF INCREASING DIFFICULTY SELECTED FROM GRAY'S STANDARDIZED READING PARAGRAPHS

Paragraph	Average Number of Fixations per Line	Average Duration of Fixation Pauses†	Number of Words Read	Average Number of Words Read per Fixation	Total Time for Five Lines†
4	5.2	5.4	45	1.73	136
6	6.2	5.5	49	1.58	164
8	5.8	6.4	42	1.44	186
10	5.6	6.0	34	1.21	168
12	6.8	7.4	32	0.97	225

* In all of the calculations of averages from eye-movement records, the first line and the last are omitted, because it has been shown in earlier investigations that these lines are of special character. The figures presented in the tables are, therefore, from the second line to the next to the last, inclusive.

† The time unit used in all of the tables is one twenty-fifth of a second.

The facts here described have led to the use of the term "span of recognition" in describing the reader's mental achievement in taking in reading matter during a single fixation.

Evidently the immature reader will have a narrow span of recognition. Correspondingly, when the content of a passage becomes increasingly difficult for a mature reader, he is thrown back by the increasing difficulty into the class of immature readers with reference to that particular passage. Each step in his mental endeavor then covers less ground, because for each impression received he must carry on a more elaborate and laborious process of interpretation.

There is, however, a second expedient which the reader can adopt in the presence of a difficulty. He may take in a considerable body of impressions and spend more time in trying to master that which confronts the eye. If one can have more time to collect experiences which will interpret a phrase, one may be saved the necessity of cutting down the amount which one is trying to take in. This is what Subject D.S. does in the case of Paragraph 8.

Incidentally, the table shows something with regard to the structure of Gray's test. Paragraphs 4, 6, and 8 are made up of words of about the same length. The "hard" paragraphs, 10 and 12, contain long words. These are what make the passages especially hard to read orally. Evidently Subject D.S. did not find Paragraph 10 as difficult in some respects as Paragraph 8. When we consider the number of words read per fixation, however, we see that there was a contraction of the individual recognitions even in this case. This must mean that the contraction of the span of recognition was common to all of the paragraphs as compared with the first, while the longer fixation pauses in such cases as Paragraph 10, when compared with Paragraph 6, mean more complicated efforts at interpretation.

Another type of adjustment to difficulty appears when we study the detailed record of Subject M.B. This record is given in Table II.

TABLE II

RECORD OF SUBJECT M.B. IN SILENT READING OF PARAGRAPHS OF INCREASING DIFFICULTY SELECTED FROM GRAY'S STANDARDIZED READING PARAGRAPHS

Paragraph	Average Number of Fixations per Line	Average Duration of Fixation Pauses	Average Number of Words Read per Fixation	Total Time for Five Lines
4	7.0	5.1	1.29	178
6	8.2	5.5	1.19	225
8	11.2	5.5	0.75	308
10	6.2	6.5	1.09	201
12	11.0	6.9	0.58	379

Subject M.B. shows a very sudden change in her methods of meeting difficulty. Through the first three paragraphs she increases the number of fixations per line. In Paragraph 10 she adopts the method of lengthening the fixation pause.

It is not easy to explain this series of records. Paragraph 8 has fewer words than Paragraph 6, as shown in Table I. We cannot, therefore, attribute the increase in number of fixations to concentration on single words. We must look for an explanation in the varying contributions which individual experiences bring to the interpretation of passages. Very striking evidence of this appears in the fact that the subjects reported in Tables I and II proceeded by wholly different modes of adjustment. If special attention is given to the last columns in the two tables, the suggestion naturally comes to mind that the differences in method of

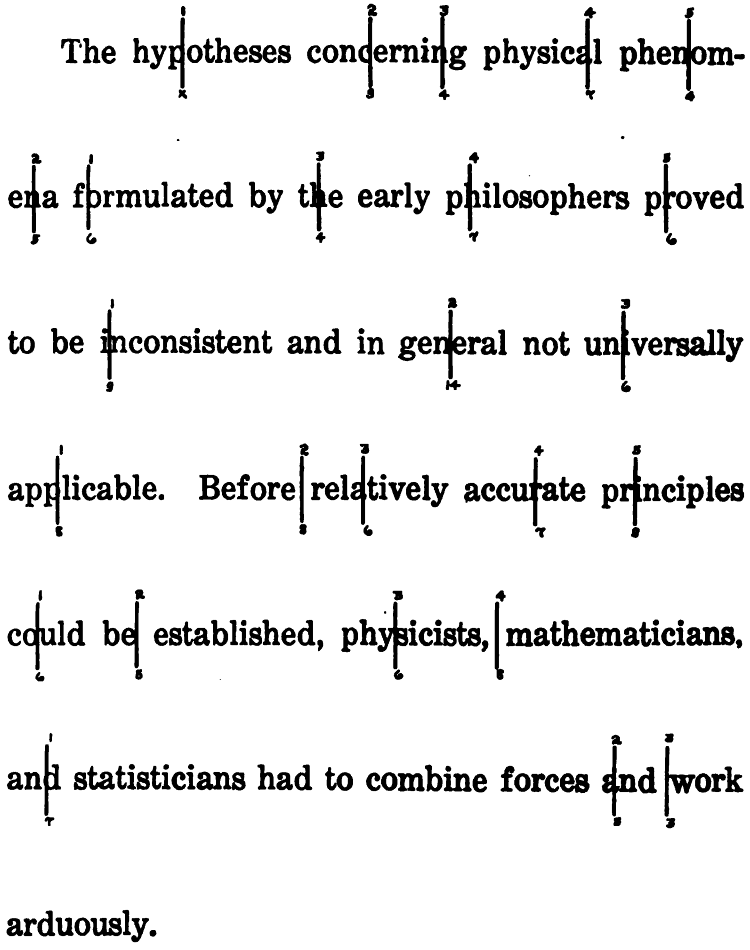

The hypotheses concerning physical phenom-
ena formulated by the early philosophers proved
to be inconsistent and in general not universally
applicable. Before relatively accurate principles
could be established, physicists, mathematicians,
and statisticians had to combine forces and work
arduously.

PLATE I.—Silent-reading record of Subject C. W. Numerous omissions of difficult words. (Each vertical line shows the position of a fixation. The numbers at the upper ends of the lines show the serial order of the fixations. The numbers at the lower ends of the lines show the length of the fixations in twenty-fifths of a second. An × at the lower end of a line indicates that the record was illegible. A crooked or oblique line means a movement during the period of fixation.)

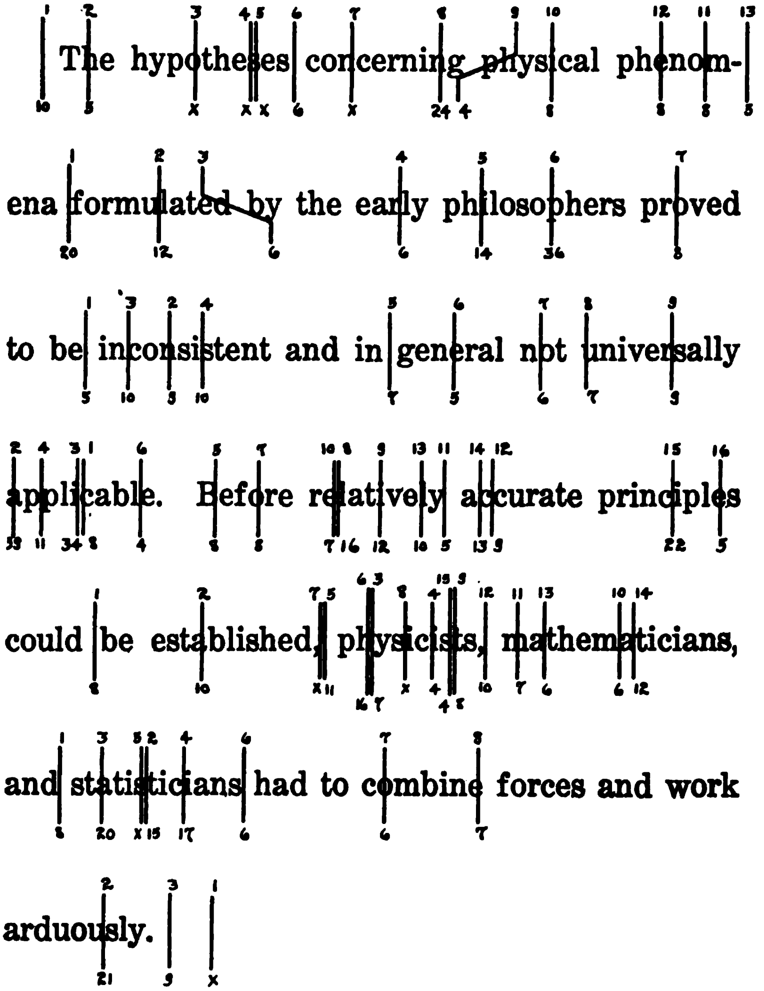

The hypotheses concerning physical phenom-
ena formulated by the early philosophers proved
to be inconsistent and in general not universally
applicable. Before relatively accurate principles
could be established, physicists, mathematicians,
and statisticians had to combine forces and work
arduously.

Plate 2.—Oral-reading record of Subject C.W. Record subsequent to that shown in Plate 1.

adjustment arise from the fact that Subject M.B. is a slow reader. This fact, in turn, is illuminated by a comparison of the two columns showing the average number of fixations per line. The major reason why Subject M.B. is slow is that she makes many fixation pauses. Her adjustments to difficulty follow the line of her general habit until the number of fixations becomes excessive, as in Paragraph 8, whereupon a radically different method appears in the next paragraph.

A third interesting case is exhibited in Plates 1 and 2. Subject C.W., who seemed on the face of the results to break all of the rules, read Paragraph 12 as shown in Plate 1. It was so evident from this record that this subject was omitting, in his silent reading, all of the words which were inconvenient that he was asked to read the same paragraph out loud, with the result shown in Plate 2.

TABLE III

Record of Subject M.H. in Silent Reading of Paragraphs of Increasing Difficulty Selected from Gray's Standardized Reading Paragraphs

Paragraph	Average Number of Fixations per Line	Average Duration of Fixation Pauses
4	6.0	5.8
6	4.2	7.4
8	6.3	6.7
10	7.4	6.8
12	8.2	7.9

These plates can hardly be said to show a method of meeting difficulties, but they exhibit the method of poor reading which many pupils doubtless adopt in dealing with such reading matter as they encounter in some of their lessons.

A fourth case in this series presents another type of adjustment to difficulty which is worth noting. The facts are shown in Table III. The striking feature of this table is the contrast of method shown in the different paragraphs.

Enough has been given of the details in this part of the investigation to prove, first, that an increase in the difficulty of passages results in a change in the reader's attitude toward the task which he is undertaking. There are various ways of meeting the complex situations that arise. The assumption that any single formula of simple association between words and their meanings can be made the basis of teaching is immediately discredited by an examination of such details as have been presented in these records. It is also evident, in the second place, that complex reading processes can be understood only when individual pupils are studied. General tables of median practices are suggestive, perhaps, as showing general tendencies, but they do not reveal the essential facts, because these facts are different for different individuals.

In Table IV are presented the medians for ten pupils, including the four to the discussion of whose records the foregoing paragraphs have been devoted. This table serves to emphasize the general fact that increased difficulty of passages means new combinations of scope and duration of attention, but the series of figures presented should be interpreted also in the light of the individual variations set forth in the foregoing tables. The medians cover up the manifold variations which in fact appear in the changes which, as we have seen, emphasize now one, now the other, mode of adjustment.

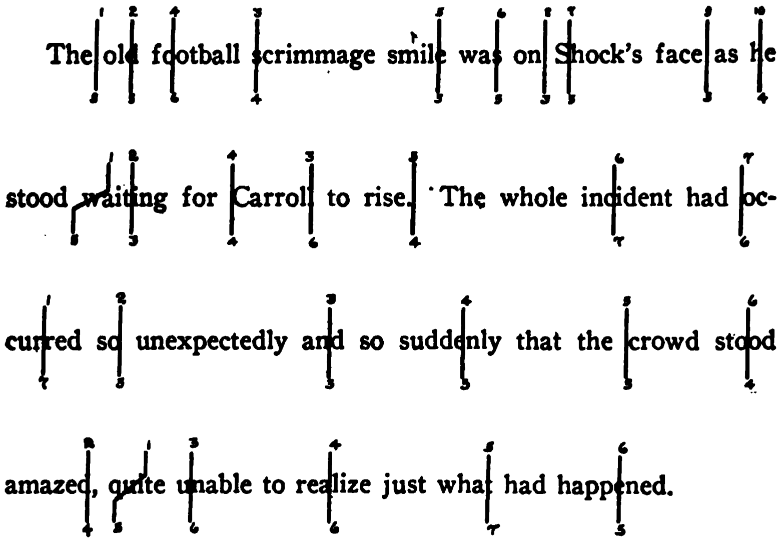
TABLE IV

MEDIANS OF THE RECORDS OF TEN FIFTH-GRADE PUPILS. SILENT READING OF PARAGRAPHS OF INCREASING DIFFICULTY SELECTED FROM GRAY'S STANDARDIZED READING PARAGRAPHS

Paragraph	Average Number of Fixations per Line	Average Duration of Fixation Pauses	Average Number of Words Read per Fixation
4	6.0	5.9	1.50
6	7.0	6.1	1.40
8	7.2	6.2	1.16
10	6.4	6.2	1.06
12	7.8	6.9	0.82

The qualifying statements made regarding Table IV should be kept in mind throughout this monograph as ample justification for constant insistence on individual analysis. There can be little doubt that all of the more complex processes are highly individuated. They are, as was pointed out in the introductory chapter, complex patterns, not uniform mechanical structures. As complex patterns, they are more dependent on subjective factors, such as acquired tendencies with regard to frequent pauses in reading, than on any external impressions.

The results which have been reported up to this point were confirmed and amplified by a series of photographs of the eye-movements made by university students. Five students were asked to read long passages of different types of reading matter. Thirty-six lines of each type were read silently by each subject, and seven varieties of material were used.



The old football scrimmage smile was on Shock's face as he stood waiting for Carroll to rise. The whole incident had occurred so unexpectedly and so suddenly that the crowd stood amazed, quite unable to realize just what had happened.

PLATE 3.—Silent-reading record of Subject G.H. Simple prose fiction

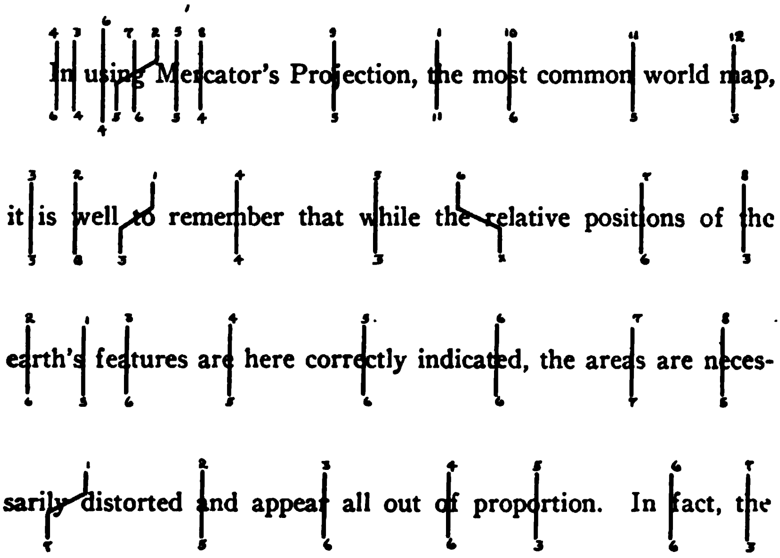

In using Mercator's Projection, the most common world map,
it is well to remember that while the relative positions of the
earth's features are here correctly indicated, the areas are neces-
sarily distorted and appear all out of proportion. In fact, the

Plate 4.—Silent-reading record of Subject G.H. Passage from a geography text

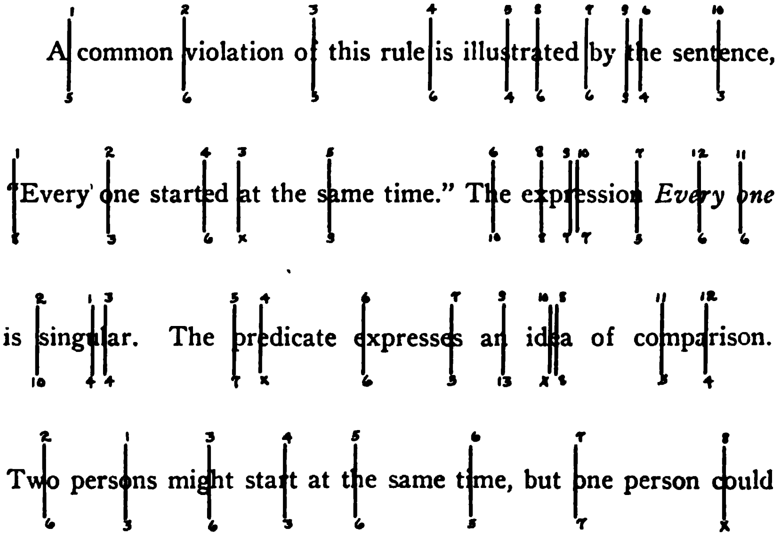

A common violation of this rule is illustrated by the sentence,
"Every one started at the same time." The expression Every one
is singular. The predicate expresses an idea of comparison.
Two persons might start at the same time, but one person could

Plate 5.—Silent-reading record of Subject G.H. Passage from a textbook on rhetoric.

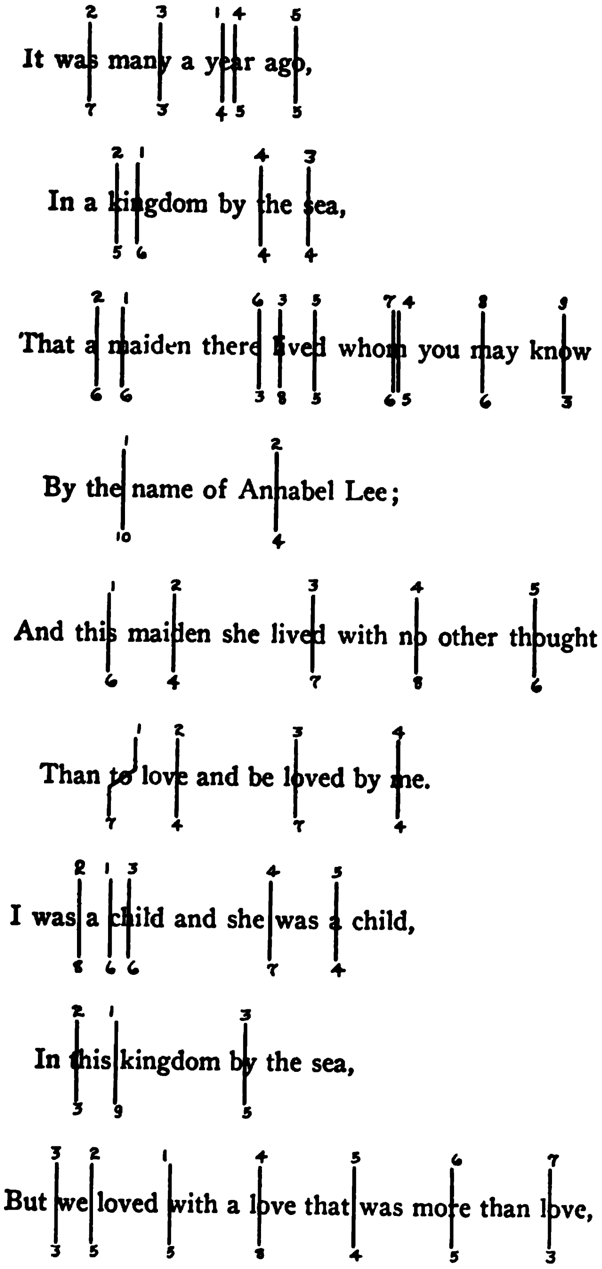
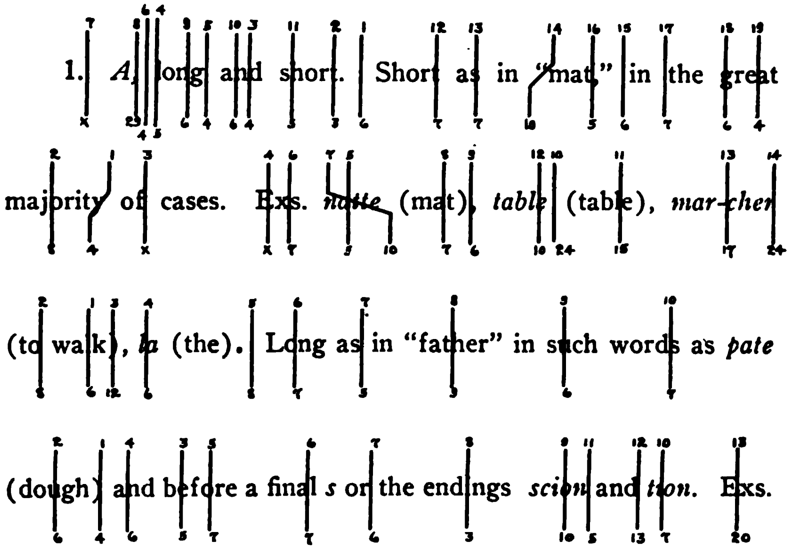

2 3 1 4 5
It was many a year ago,
7 3 4 5 5
2 1 4 3
In a kingdom by the sea,
5 6 4 4
2 1 6 3 5 7 4 8 9
That a maiden there lived whom you may know
6 6 3 8 5 6 5 6 3
1 2
By the name of Annabel Lee;
10 4
1 2 3 4 5
And this maiden she lived with no other thought
6 4 7 8 6
1 2 3 4
Than to love and be loved by me.
7 4 7 4
2 1 3 4 5
I was a child and she was a child,
8 6 6 7 4
2 1 3
In this kingdom by the sea,
3 9 5
3 2 1 4 5 6 7
But we loved with a love that was more than love,
3 5 5 8 4 5 3

PLATE 6.—Silent-reading record of Subject G.H. Extract from an easy poem



1. *A*, long and short. Short as in "mat," in the great majority of cases. Exs. *natte* (mat), *table* (table), *mar-cher* (to walk), *la* (the). Long as in "father" in such words as *pate* (dough) and before a final *s* or the endings *scion* and *tion*. Exs.

PLATE 7.—Silent-reading record of Subject G.H. Passage from a French grammar

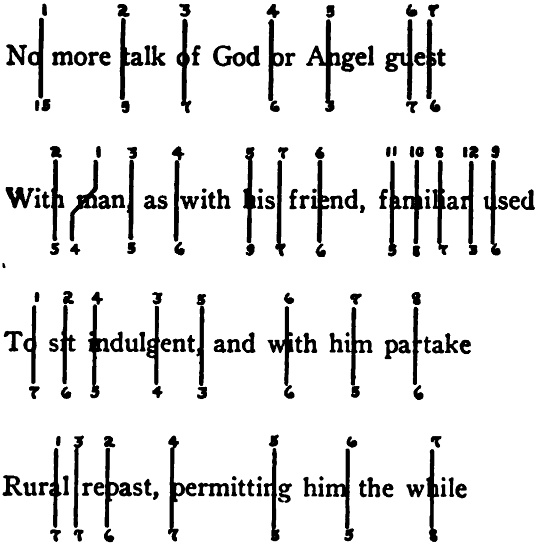
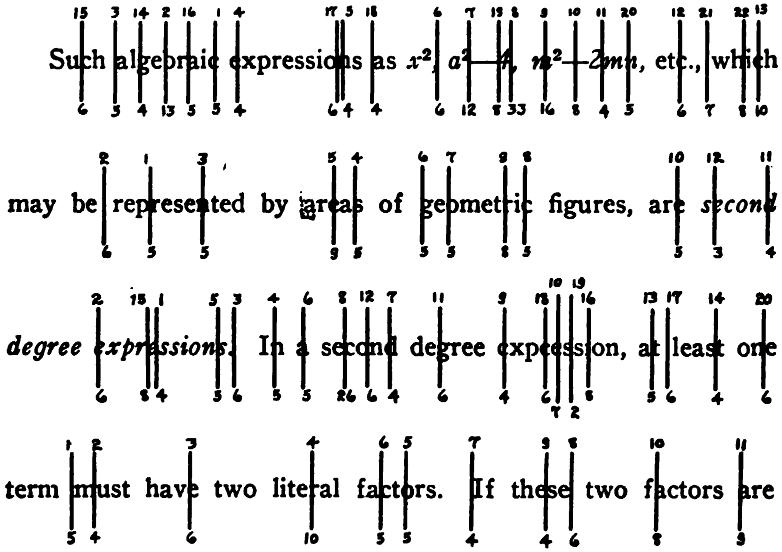

No more talk of God or Angel guest
With man, as with his friend, familiar used
To sit indulgent, and with him partake
Rural repast, permitting him the while

PLATE 8.—Silent-reading record of Subject G.H. Difficult poetry



Such algebraic expressions as x^2, a^2-4, m^2+2mn, etc., which may be represented by areas of geometric figures, are *second degree expressions.* In a second degree expression, at least one term must have two literal factors. If these two factors are

PLATE 9.—Silent-reading record of Subject G.H. Passage from a text in algebra

The differences here dealt with were like those presented to the pupils of the fifth grade—differences in difficulty—but they were also qualitative differences. The following list will indicate the range of passages. Two poems were used: *Annabel Lee*, as an example of easy verse, and a section from *Paradise Lost*, beginning, "No more talk of God or Angel guest," as an example of blank verse. Prose extracts were taken from a book of fiction, a textbook on geography, a textbook on rhetoric, a French grammar, and a textbook on algebra.

Inspection of the records made by the readers of these different types of reading matter arouses a vivid realization of the different types of mental attitudes in the readers' minds. Plates 3–9 exhibit records from a single subject, G.H., and present in each case a few typical lines. They are arranged in the order of their difficulty, as indicated by the average number of fixations per line. This order holds also for the average duration of fixation pauses, except that Plates 7 and 9 would have to be interchanged if that basis of arrangement were adopted.

Attention may be called to a number of significant details in the plates. The fiction is read with uniform, short fixations which show by their relatively small number per line and by their uniform distribution and brevity that the reader is encountering no difficulties. The simple reading in rhetoric and geography is regular but requires a slightly higher degree of mental effort, as attested by the increased duration of the fixation pauses. When we come to the poetry and to the French grammar, we find that the movements are jerky and often quite irregular.

The train of experiences which comes to a reader who moves his eyes haltingly across a line is different in quality from the train which comes when the eyes move freely and smoothly. The reader will not be conscious of the eye-movements as separate items of experience, but he will be aware of a certain roughness and unevenness of ideas and impressions.

It is not, however, these consequences of eye-movements which are of major importance for our study. Eye-movements are but external manifestations of an inner condition which is set up in the central nervous system. Whenever there is a jerky, irregular eye-movement and a short span of recognition, there is a central nervous process which is also irregular and of short duration. Modern psychology has made its most fruitful advances by recognizing the intimate relation of external behavior and its accompanying conditions in the nervous system to conscious experience. The impressive fact about changes in eye-movements is, accordingly, not some consequence of this or that mode of fixation but the radical change in the total attitude of the reader in the different cases. The muscular tension which is exhibited in reading French grammar is wholly different from that exhibited in reading fiction. This means that the central nervous tension in one case is very different from that in the other case.

Nor should the fact be overlooked that these differences are not limited to particular and individual eye-movements and single fixations. The whole succession of acts is in the one case free and in the other case restrained and even cramped in range.

The conscious individual who is manifesting these differences is located at the center of the whole situation, that is, his consciousness reflects what is going on in the central nervous system. He is not aware of the eye-movements, but his awareness of the passage is of the type which is conditioned by the inner tension of his nervous system. Eye-movements are as direct measures of the mental state as the rate of the pulse is a measure of the heart-beat. The heart-beat, in turn, is not significant for its own sake, but because it is part of the patient's general organic condition. The rate of the pulse is invaluable as a means of diagnosis because it is a part of the total organic situation.

The significant lesson to be drawn from such records as appear in Plates 3–9 is that there are many different modes of reading. Different kinds of material induce different reading attitudes. It would be an entirely false description of the central nervous condition as exhibited through these eye-movements to say that the words are coupled with their respective meanings in the same way in the various passages and that the more difficult passages are merely larger aggregations of words plus meanings. The truth is that there is a new general tension in every case in which a collection of words begins to require more effort. The whole organism is drawn into the performance. Every movement of the eye is different, showing that the motor impulses are flowing in the one case out of one kind of a central nervous situation and in the other case out of a different kind of central nervous situation.

This mode of understanding experience is not so simple and mechanical as the theory of associative tracts and bonds, but it is more in keeping with the general experiences of teachers. No practical teacher can be told that the ease and interest in reading a story are to be explained by the same formula as the drudgery and feeling of resentment with which many of the same words are often read in trying to learn a lesson in geography. One situation is explained by a certain kind of nervous tension, the other by a different kind. Consciousness is in the one case a pattern or an organized whole of one type; in the other case the words enter into a wholly different pattern.

These conclusions can be reinforced by adding to the records of a single subject Tables V, VI, VII, and VIII, showing in full the facts regarding the eye-movements of four readers. These tables are not as picturesque as the records themselves, and they introduce new complications in the form of contrasts between individuals. They will repay careful study, however, because they show very impressively that there are many different kinds of silent reading.

TABLE V

Record of Subject G.H. in Silent Reading of Different Kinds of Passages

Type of Material	Average Number of Fixations per Line	Average Duration of Fixation Pauses	Average Number of Regressive Movements
Fiction................	6.1	5.7	3.0
Geography............	7.3	5.9	1.1
Rhetoric..............	8.6	6.0	1.5
Easy verse*...........	9.4	6.1	1.9
French grammar.......	10.6	7.5	2.3
Blank verse*...........	11.9	6.8	2.6
Algebra...............	12.5	6.6	3.1

*Since the lines in the passages of poetry are not equal in length to the lines in the prose passages, the number of fixations is weighted so as to correspond to the number that would appear if the lines were of the length of those in the prose passages.

TABLE VI

Record of Subject L.M. in Silent Reading of Different Kinds of Passages

Type of Material	Average Number of Fixations per Line	Average Duration of Fixation Pauses	Average Number of Regressive Movements
Fiction................	8.5	4.9	2.1
Geography............	11.2	5.2	3.2
Rhetoric..............	11.7	5.0	3.7
Easy verse............	13.1	5.0	3.7
French grammar.......	14.1	5.1	4.0
Blank verse............	16.8	5.2	6.1
Algebra...............	14.4	5.3	4.5

The first observation which is to be made regarding Tables V–VIII is that not all of the subjects exhibit the same order of increasing number and duration of fixations. Every table shows that fiction is the easiest kind of material used. There is, on the other hand, little agreement regarding the most difficult passage. Especially impressive, perhaps, is the difficulty exhibited by C.B. in reading *Annabel Lee.*

The explanation of the contrasting attitudes of various readers in dealing with difficult types of reading matter is not far to seek. One reader is absorbed in mathematics and to him this subject is almost as easy as fiction, while another reader finds mathematics difficult to a degree that makes it utterly distasteful. Individual training in these two cases has been entirely different. Even if the two readers grew up in the same environment, even if industrious and conscientious school officers offered to both exactly the same opportunity to cultivate the reading of mathematics, the contrast would persist. The contrast would probably grow more and more marked with progressive drill. One reader swings into an easy, fluent stride and shows interest and comprehension when he reads about algebraic formulas; another halts and stumbles and grows afraid. The attitude which one cultivates often becomes more and more fixed through repetition. It has long been clear to psychologists that

TABLE VII

Record of Subject P.M. in Silent Reading of Different Kinds of Passages

Type of Material	Average Number of Fixations per Line	Average Duration of Fixation Pauses	Average Number of Regressive Movements
Fiction	6.2	5.6	.21
Geography	7.9	6.3	.65
Rhetoric	7.7	5.9	.62
Easy verse	8.4	6.7	.32
French grammar	8.0	7.0	.43
Blank verse	8.5	6.5	.52
Algebra	9.5	6.1	.57

TABLE VIII

Record of Subject C.B. in Silent Reading of Different Kinds of Passages

Type of Material	Average Number of Fixations per Line	Average Duration of Fixation Pauses	Average Number of Regressive Movements
Fiction	8.0	5.9	.4
Geography	8.5	6.3	1.2
Rhetoric	8.3	5.9	1.5
Easy verse	10.0	6.8	1.2
French grammar	11.8	6.8	2.3
Blank verse	9.6	6.3	1.4
Algebra	8.1	6.6	1.0

repetition often makes a bad situation worse. Bad kinds of central nervous tensions lead to habits just as much as do good kinds of tensions. It comes to pass, accordingly, that mature individuals are more and more sharply distinguished from each other as experience accumulates.

There are other contrasts which Tables V–VIII bring out. Subject L.M. meets all of his difficulties by readjusting the number of fixations per line. There is very little variation in the length of his fixations. Subjects G.H. and P.M., on the other hand, show a variation of several points in the duration of fixations and thus counterbalance somewhat their changes in the number of fixations.

In view of the results obtained in an earlier investigation[1] which compared the average duration of the fixation pauses of a large number of subjects, it is known that a fixation period of five to six twenty-fifths of a second is a close approximation to the best accomplishment of the ordinary reader. It is safe, therefore, to assume that Subject L.M. is regular in the length of his fixation pauses because he has reached approximately the lower limit of duration for a reading pause. Furthermore, the uniformity which his records exhibit in this respect suggests that increasing expertness in recognition leads to increased uniformity. This subject's adjustments do not tend to modify the element of his behavior which has reached a point very near to perfection. All of the other subjects have average durations which show that they are less highly practiced in rapid recognition than is L.M. The irregularities in their records can probably be explained by their lack of fixed habits in this respect.

It is interesting to inquire whether two individuals differ from each other with regard to their speed of reading in the same way throughout the series. For the purpose of illustration, we may compare Subjects G.H. and L.M. In reading fiction, Subject G.H. has the advantage to such a degree that in a given length of time he reads 19 per cent more than Subject L.M. The advantage lies with Subject G.H. in geography to the extent of 35 per cent; in rhetoric, 13 per cent; in easy verse, 14 per cent; and in blank verse, 8 per cent. On the other hand, the advantage lies with Subject L.M. in French grammar, 10 per cent; and in algebra, 21 per cent. Evidently, therefore, there are marked individual adaptations to varieties in reading matter.

Inspection of Tables V–VIII shows that Subjects P.M. and C.B. show exceptional facility in their reading of algebra.

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[1] Guy Thomas Buswell, *Fundamental Reading Habits: A Study of Their Development*, Supplementary Educational Monographs, No. 21. Chicago: Department of Education, University of Chicago, 1922.

Other comparisons can be made. Thus, all of the varieties of adjustment, as between number and duration of fixations, which were noted in the first half of this chapter reappear in these tables. In reading French grammar Subject C.B. exhibits long pauses and a large number of fixations, while Subject P.M. shows long pauses and a relatively small number of fixations. Subject P.M. shows a very marked difference between fiction and geography, while C.B. shows relatively much less variation in the two records.

One general fact should be noted in connection with all of these records. The number and length of fixations are relatively great as compared with those recorded in many of the earlier studies of eye-movements. This shows that throughout we are dealing with difficult types of reading.

The findings of this chapter can be directly related to the well-known facts of ordinary life. Teachers know that whenever pupils pass from one kind of reading matter to another there is a change in the rate of reading. This change in rate is conditioned by a change in the number and duration of fixations. The rate is not significant in itself, but as an indication of differences within the subject's mental life it is a matter of the largest interest to teachers.

What is needed in addition to a knowledge of the gross fact of change in rate is insight into the complex of facts which cause the change in rate. Teachers need to know that some pupils require for improvement training in rapid observation, while others require training in the experiences which will supply the ideas necessary to facilitate interpretation. Above all, teachers need to realize that a slow rate of reading shows that the pupil's equipment is in some respect incomplete.

School methods must be devised which will help pupils to improve their reading far beyond the point which is now ordinarily thought of as constituting the terminus of instruction in reading. There ought, for example, to be a technique of teaching high-school students to read algebra fluently and intelligently. There ought to be teaching of methods of reading science. These higher applications of reading ability are not to be ignored or thought of as automatically provided for by training given through the reading of fiction or poetry.

CHAPTER III

EFFECTS OF CHANGES IN THE READER'S ATTENTION

Given exactly the same kind of reading matter, it is possible at different times to induce in the reader wholly different kinds of attention. The reading processes will then reflect not so much the uniformity of the passages as the differences in the mental attitudes with which the reader approaches his tasks. In ordinary life we know full well that a reader may read carelessly if he does not see the relation of reading to his personal interests, or he may be induced to read most carefully if he is offered such an incentive as the promise of a reward. One may, through an exercise of his own volition, read rapidly or deliberately. The results of these various types of reading, as indicated by the different degrees of comprehension of what has been read, are known to be in many cases strikingly different. It will be the task of this chapter to make an analysis of several typical reading attitudes and to ask what are some of the details of the reading process when the reader is in one attitude or the other.

The first experiment was tried with fourteen sixth-grade pupils, five high-school pupils, and one college student. A passage from Thorndike's Alpha Reading Test was given to these subjects, and they were first asked to read it as they would read an ordinary newspaper item. The exact directions were: "Read this paragraph through once silently. Read it very rapidly as you would read a newspaper article, just to find out what it is about." Immediately after the first reading the subjects were instructed: "Now read it again more carefully. When you finish, you will be asked questions about it."

Table IX gives the results for the twenty subjects. A number of important facts can be pointed out in this table. First, the different individuals reacted in very different ways to the two sets of conditions. Subjects 199 and 203 behaved in almost exactly the same way in the two cases, while Subjects 198 and 86 lengthened the duration of fixations and also increased the number of fixations to a very marked degree. Subjects 202 and 97 increased the number of fixations, but counterbalanced this by a reduction in the duration of the fixations, while Subject 89 reversed the relation between the number and the duration of the fixations.

There is one general difficulty in interpreting the figures in Table IX; this difficulty does not invalidate the contrasts pointed out when comparisons are made between various individuals, but it does obscure somewhat the meaning of the records of an individual when considered by themselves. The readers carried over from the first reading to the second some familiarity with the passage and, consequently, there must have been a very strong tendency to make in the second reading a much better record than would have been made if the passage had been wholly unfamiliar. When, therefore, we find, as in the case of such a reader as Subject 198, a marked increase in the number and duration of fixations, this must mean that the change in the reader's attitude due to the exhortation to read carefully is even more marked than the statistics show.

TABLE IX

VARIATIONS IN READING DUE TO THE ATTITUDES OF RAPID READING AND STUDY

SUBJECT*	AVERAGE NUMBER OF FIXATIONS PER LINE		AVERAGE DURATION OF FIXATION PAUSES		AVERAGE NUMBER OF REGRESSIVE MOVEMENTS PER LINE	
	Rapid Reading	Study	Rapid Reading	Study	Rapid Reading	Study
202	6.9	11.5	6.2	5.8	0.9	2.8
201	6.6	9.1	6.8	7.9	0.5	0.9
200	4.3	6.1	6.1	6.3	0.4	1.1
199	10.6	10.5	5.6	5.5	2.0	1.9
198	8.8	14.0	5.6	6.0	0.3	2.5
86	7.6	11.0	5.5	6.6	0.8	1.8
87	8.6	9.4	5.2	5.6	1.3	1.6
99	7.3	7.8	6.2	5.6	1.1	1.0
91	8.6	10.5	6.1	7.0	1.1	1.5
95	7.4	8.0	5.1	5.9	0.8	1.3
96	6.6	9.4	5.4	6.0	1.1	2.3
94	10.4	10.0	5.6	6.4	2.6	2.1
104	8.0	14.1	4.9	5.0	1.4	3.9
103	14.3	13.0	6.2	6.1	5.8	3.7
97	8.1	10.6	6.4	6.0	0.8	1.5
203	7.5	7.8	7.6	7.7	0.7	1.4
89	9.0	7.6	5.8	6.3	2.1	1.8
100	9.1	9.9	7.4	7.3	1.9	2.0
90	7.6	8.0	5.2	7.3	1.6	2.7
102	7.3	8.1	5.4	6.4	1.3	1.1

* The records reported in this table are for subjects whose other records are discussed in Buswell's *Fundamental Reading Habits: A Study of Their Development*. The designations here used for subjects are the same as those employed in the earlier monograph.

The last two columns of Table IX, those dealing with regressive movements, are instructive. In the great majority of cases the direction to read carefully resulted in increased frequency of movements of the eye back along the line. This can be understood if one thinks of a regressive movement as implying in many cases a tendency of the reader to analyze the sentence which he is reading. As his eye moves forward and interpretation progresses, it occurs to him to compare a phrase which he passed over a moment ago with his present interpretation. He, therefore, goes back and gives attention once more to an earlier part of the passage.

Further light on the methods of reacting to the two sets of conditions here under consideration can be gained from a detailed examination of some of the individual records. Plates 10 and 11 exhibit the first four lines of the first and second readings of Subject 198. A comparison of these plates makes it clear that the changes in eye-movements resulting from a change in the subject's attention are not limited to single points. Every line in the first reading is in fundamental character like every other line in the first reading and strikingly different from every line in the second reading. Again, the lines in the second reading are like each other. During the first reading the subject moves from fixation point to fixation point with steps that are uniform, and the durations of the successive fixation pauses are enough alike to make it evident that the reader is complete master of the situation and is conscious of the steady progress of interpretation. The second reading is evidently of a different type throughout its entire course. The steps between fixation pauses are short. Some of the fixations are very long, and the whole picture is one of an entirely different type of attention from that exhibited in the first reading.

The same general types of reactions are shown in Plates 12 and 13, which are the first four lines of the records of Subject 104. Reference to Table IX will show that this subject met the situation chiefly by changing the number of fixations per line.

Plates 14 and 15 are the first four lines of the records of Subject 94. They are reproduced here because an examination of them shows why the second record is not more labored than the first. This pupil, like many another in the schools, does not exhibit any ability to comply with the direction to read a passage rapidly. All reading for such a pupil is a form of study. Consequently, the second record shows no marked change from the first.

Finally, as a last example of this series, Plates 16 and 17 exhibit the first four lines of the records of Subject 102. He is a good reader, but evidently little affected by the exhortation to study the passage carefully. Practical teachers will have no difficulty in recalling students of this type.

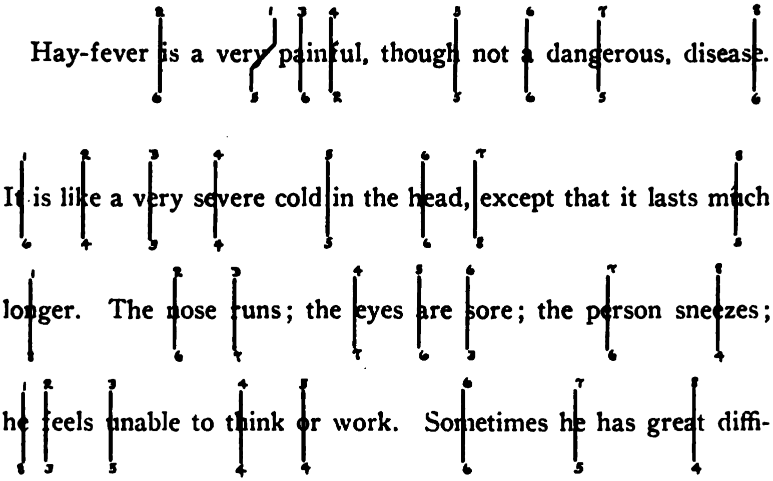

Hay-fever is a very painful, though not a dangerous, disease.
It is like a very severe cold in the head, except that it lasts much
longer. The nose runs; the eyes are sore; the person sneezes;
he feels unable to think or work. Sometimes he has great diffi-

PLATE 10.—Silent-reading record of Subject 198. Rapid, superficial reading

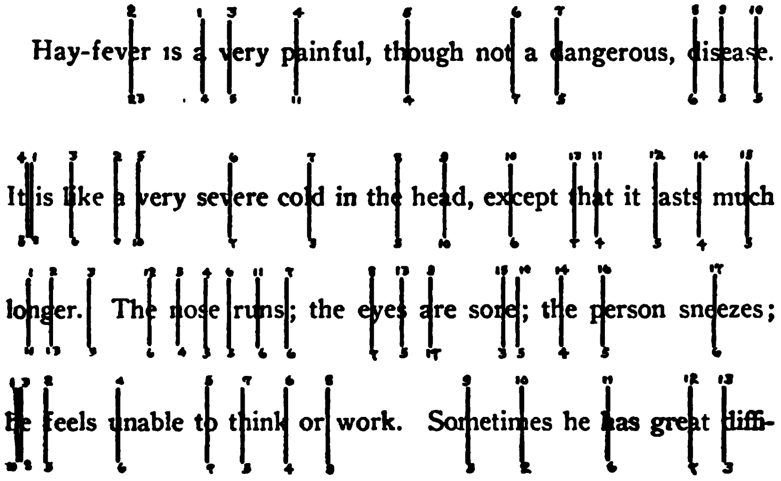

Hay-fever is a very painful, though not a dangerous, disease.
It is like a very severe cold in the head, except that it lasts much
longer. The nose runs; the eyes are sore; the person sneezes;
he feels unable to think or work. Sometimes he has great diffi-

Plate 11.—Silent-reading record of Subject 198. Slow, careful reading preparatory to answering questions.

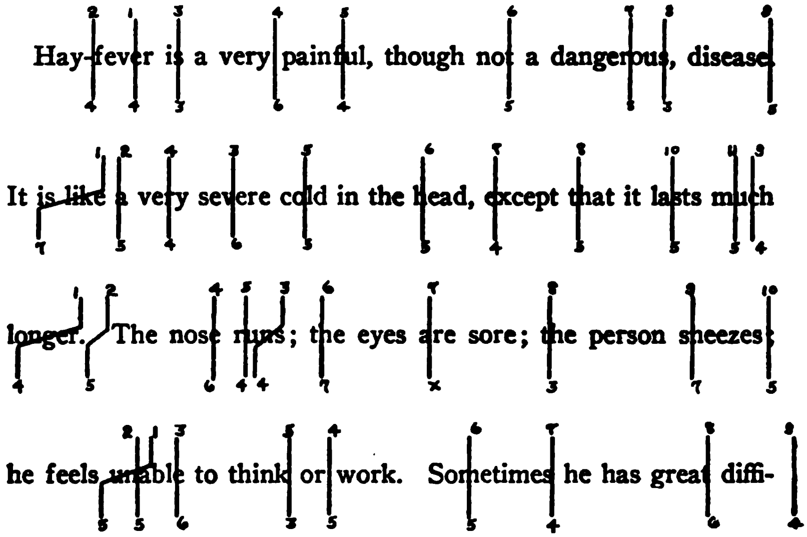
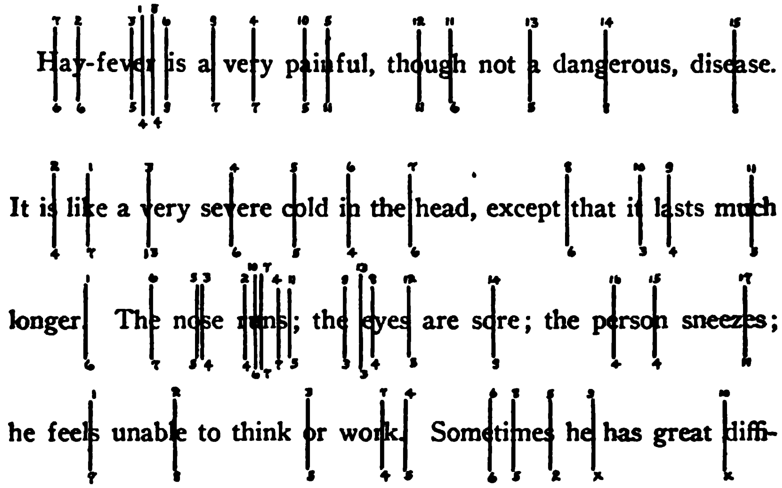
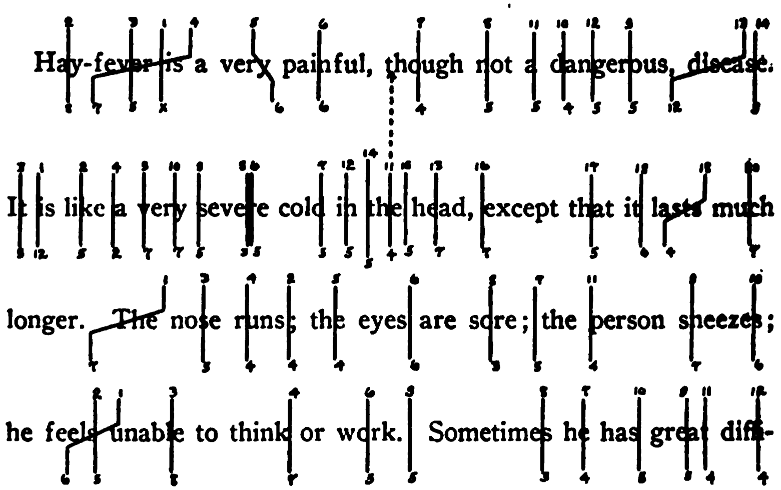

Hay-fever is a very painful, though not a dangerous, disease.
It is like a very severe cold in the head, except that it lasts much
longer. The nose runs; the eyes are sore; the person sneezes;
he feels unable to think or work. Sometimes he has great diffi-

PLATE 12.—Silent-reading record of Subject 104. Rapid, superficial reading



Hay-fever is a very painful, though not a dangerous, disease. It is like a very severe cold in the head, except that it lasts much longer. The nose runs; the eyes are sore; the person sneezes; he feels unable to think or work. Sometimes he has great diffi-

Plate 13.—Silent-reading record of Subject 104. Slow, careful reading preparatory to answering questions.



Hay-fever is a very painful, though not a dangerous, disease. It is like a very severe cold in the head, except that it lasts much longer. The nose runs; the eyes are sore; the person sneezes; he feels unable to think or work. Sometimes he has great diffi-

PLATE 14.—Silent-reading record of Subject 94. Deliberate reading in spite of direction to read rapidly.

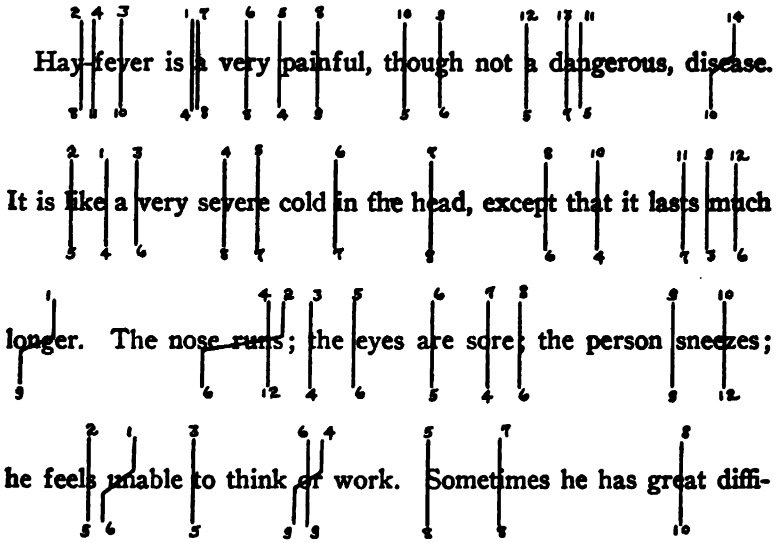
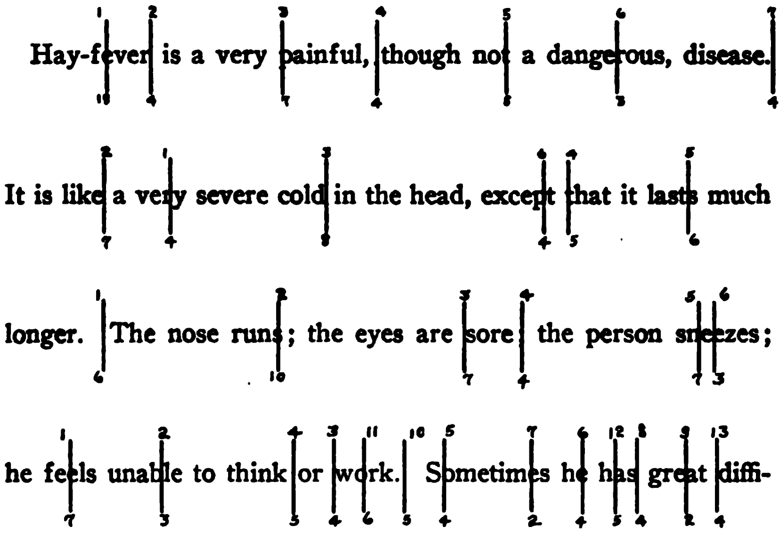

Hay-fever is a very painful, though not a dangerous, disease.
It is like a very severe cold in the head, except that it lasts much
longer. The nose runs; the eyes are sore; the person sneezes;
he feels unable to think or work. Sometimes he has great diffi-

PLATE 15.—Silent-reading record of Subject 94. Slow, careful reading preparatory to answering questions.



Hay-fever is a very painful, though not a dangerous, disease. It is like a very severe cold in the head, except that it lasts much longer. The nose runs; the eyes are sore; the person sneezes; he feels unable to think or work. Sometimes he has great diffi-

PLATE 16.—Silent-reading record of Subject 102. Rapid, superficial reading

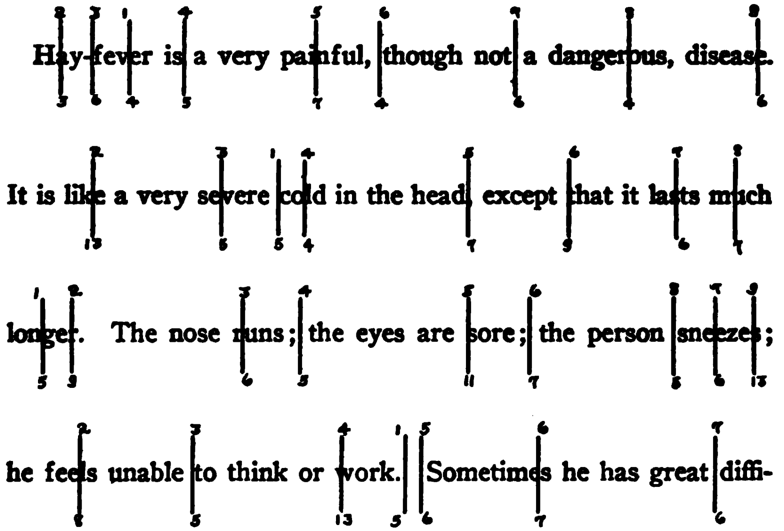

2 3 1 4 5 6 7 8 9
Hay-fever is a very painful, though not a dangerous, disease.
3 6 4 5 7 4 6 4 6
2 3 1 4 5 6 7 8
It is like a very severe cold in the head, except that it lasts much
13 5 5 4 7 9 6 7
1 2 3 4 5 6 8 7 9
longer. The nose runs; the eyes are sore; the person sneezes;
5 9 6 5 11 7 8 6 13
2 3 4 1 5 6 7
he feels unable to think or work. Sometimes he has great diffi-
8 5 13 5 6 7 6

PLATE 17.—Silent-reading record of Subject 102. Relatively little effect of direction to prepare for the answering of questions.

The general conclusion justified by an examination of the records of these twenty people is that the effect on the reading process of a call to read carefully is very different in different individuals. In some cases the effect is to narrow attention to a very limited range of words; in other cases the effect is to make the time devoted to the interpretation of certain impressions very long or quite irregular. The more common effect is the narrowing of attention.

The practical lesson for the teacher is that no class can be controlled, as a class, by the demand that a passage be read carefully. There will be some members of the class who will make no special response because they are always in the study attitude. There will be others who will not respond because they are persistently in the attitude of casual reading. Instruction in the different cases will have to be skilfully adapted to individual possibilities and tendencies. In general, instruction must recognize reduction of the scope of attention as the result most likely to follow the demand for increased care in reading.

In order to test the difference between rapid reading and careful study with reading matter which from the first requires careful attention, four high-school students and two college students were asked to read passages taken from a textbook on algebra. Their first task was to read silently a passage "as you would ordinarily read such material." The second task was to read silently the same passage "very slowly, trying to get the full meaning of the passage.". The third task was to "study" a new passage closely resembling in difficulty the first passage.

It is hardly to be expected that contrasts as sharp as those which appeared in the reading of the selection from Thorndike's Alpha Reading Test will be exhibited when algebra is the subject prescribed in the passages. In the first reading algebra will show signs of being difficult material. The results, given in Table X, confirm this expectation and show in general much the same facts as those shown in earlier tables.

The only case in this series which stands out as altogether exceptional is that of Subject 206. Plates 18, 19, and 20 show the character of her three readings. It is evident in Plate 19, which should have shown careful, slow reading, that the subject skipped all of the difficult matter. In the second chapter an example of much the same type was found in fifth-grade reading. Probably there is a great deal of evasion of reading matter in the schools.

A case of this kind should not be dismissed lightly on the assumption that the student has wilfully omitted parts of the passage which he knew he ought to read in detail. The fact is that students very often do not know what they are doing when they read. They encounter certain types of material and read them according to the impulse of the moment. The impulse of the moment is often wholly inadequate, but it fills the student's mental world. He has nothing else in mind with which to compare what he is doing and, consequently, cannot be critical of his performance.

Terry[1] has shown that the reading of an example in arithmetic differs from the reading of an ordinary prose passage in that the numbers in the arithmetic example are often overlooked during the first reading. The reader is absorbed in the directions which the problem gives him about the way in which the numbers are to be used. In such a case the reader usually comes back in a second reading to a careful recognition of the numbers. Something of this kind may have happened with Subject 206. In the second reading her attention was for some reason turned wholly away from the formula in the passage which she was supposed to read carefully. Even the phrases of the verbal part of the text were read either superficially or with the aid of the training secured during the first reading. Unfortunately, it is impossible to speak with certainty in this matter because the discovery that the formula had been skipped and that the general character of the reading was unusually rapid was not made until long after the record was taken.

It would probably have been futile to have asked the student what she did with the passage. Introspection is not easy when one is carrying on any piece of mental work. It would certainly have been wholly unproductive from an educational point of view to have dismissed the case as simply a pedagogical anomaly. The fact is that, for better or for worse, what Subject 206 did when she was told to read carefully was something wholly different from that which she did immediately before and immediately after. Whether this was due to distraction, to lack of knowledge as to methods of study, to wilful neglect, or to total ignorance of the meaning of the demand is not shown by the record. Whichever of these explanations is correct, the duty of the teacher is not to drop the case, but to deal with it. The teacher must find out whether the careful reading is effective. If it is not, the teacher must adopt methods, either of instruction or of discipline, which will bring about a change. When that change in the pupil's attitude is secured, there will be, as we know

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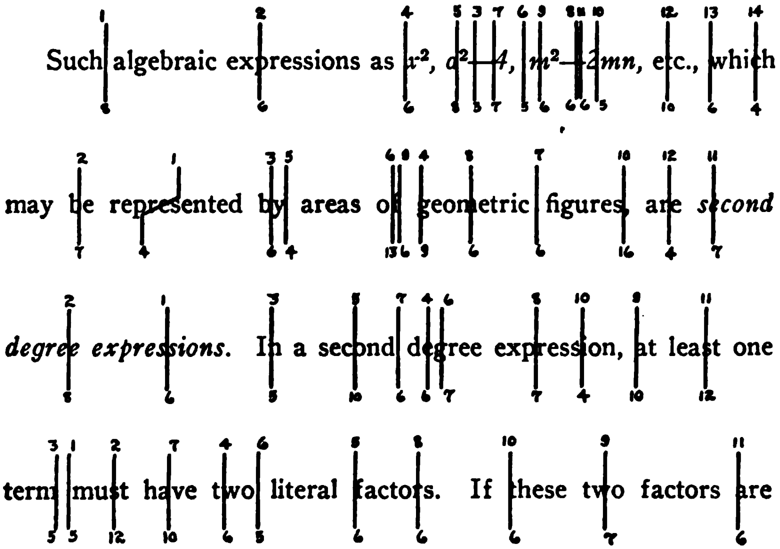
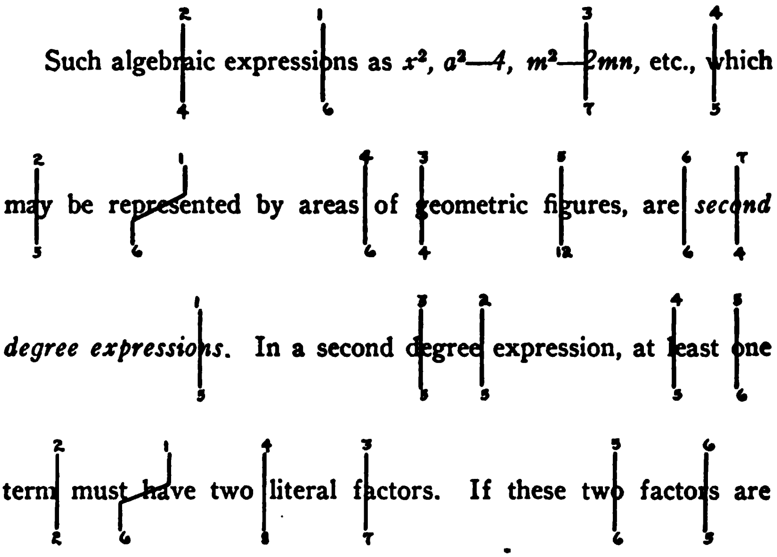
[1] Paul Washington Terry, *How Numerals Are Read: An Experimental Study of the Reading of Isolated Numerals and Numerals in Arithmetic Problems*, Supplementary Educational Monographs, No. 18. Chicago: Department of Education, University of Chicago, 1922.



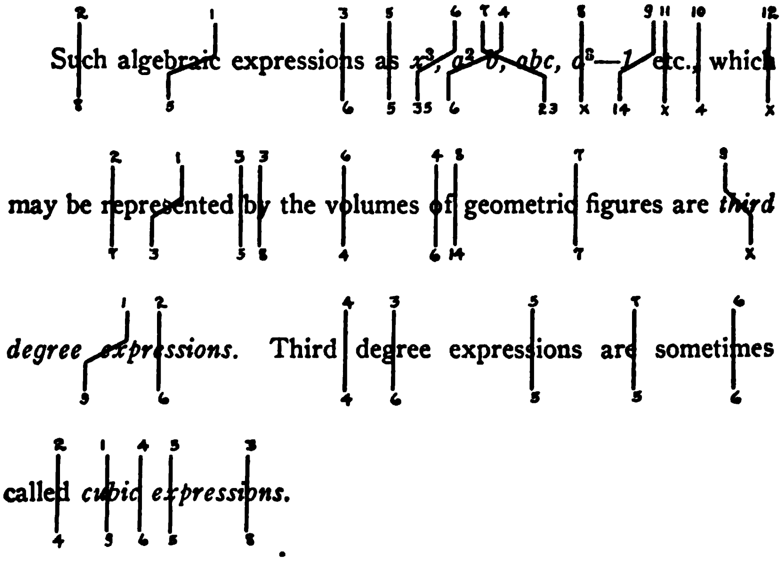
Such algebraic expressions as x^2, a^2+4, m^2+2mn, etc., which may be represented by areas of geometric figures, are *second degree expressions.* In a second degree expression, at least one term must have two literal factors. If these two factors are

PLATE 18.—Silent-reading record of Subject 206. Reading of algebra passage without special care.



Such algebraic expressions as x^2, $a^2—4$, $m^2—2mn$, etc., which may be represented by areas of geometric figures, are *second degree expressions*. In a second degree expression, at least one term must have two literal factors. If these two factors are

Plate 19.—Silent-reading record of Subject 206. Reading of algebra passage with instructions to study carefully.



Such algebraic expressions as *x^3, a^2b, abc, a^8-1*, etc., which may be represented by the volumes of geometric figures are *third degree expressions.* Third degree expressions are sometimes called *cubic expressions.*

PLATE 20.—Silent-reading record of Subject 206. Reading of new algebra passage with instructions to study carefully.

from our earlier analyses, an appropriate form of behavior and an appropriate psychological pattern.

The rest of the results reported in Table X require no special comment, because they follow the general lines of statistics reported in earlier tables and fully discussed in earlier paragraphs.

The method of inducing a change in the attitude of readers in the two experiments thus far described in this chapter was the method of telling the reader to assume a certain attitude. There is another less direct way of producing a change. The reader can be led into a certain attitude without being appealed to in explicit terms. The third section of this chapter will deal with such a case.

Six high-school students were asked to read silently an easy prose passage and were given no instructions whatsoever about the special direction of attention while reading. Immediately after this they were given a passage to be read aloud. At the close of the reading of the second passage the experimenter asked some questions about what had been read. The questions had not been expected by the students and, of course, had no effect on the attitude exhibited during the reading of the passage to which they related. They aroused the students at once, however, to a state of expectancy and, when they were asked to read a third passage silently, they read in much the same way as they would have done if they had been explicitly told that they were going to be asked questions.

TABLE X

COMPARISON OF VARIOUS READINGS OF ALGEBRA PASSAGES

Subject	Average Number of Fixations per Line			Average Duration of Fixation Pauses			Average Number of Regressive Movements per Line		
	First Reading	Second Reading	Study of New Passage	First Reading	Second Reading	Study of New Passage	First Reading	Second Reading	Study of New Passage
204	7.3	8.8	8.8	5.6	5.7	5.7	0.4	0.8	0.6
205	10.9	11.5	11.9	8.5	9.2	9.2	1.1	1.3	1.8
201	12.8	15.3	15.0	7.0	7.4	7.4	3.0	4.3	3.8
200	7.5	8.1	9.6	7.1	7.4	7.4	0.9	1.6	2.5
199	10.8	15.6	19.0	6.1	6.0	6.0	2.1	4.8	5.5
206	10.0	5.8	9.6	6.2	6.2	6.2	3.0	1.1	3.0

For the purposes of our present study we may ignore the statistics regarding the oral reading. It has been shown in earlier studies that the number of fixations and the duration of fixation pauses in oral reading are wholly different from those in silent reading. Such was the case in this experiment also and, therefore, the figures are omitted.

Table XI presents the results for the first and third passages of the experiment. The facts brought out by this table are of a type similar to those repeatedly shown in earlier tables. Subject A19, for example, prepares to answer questions by lengthening very materially the period of each fixation. In this case the average number of fixations per line is somewhat reduced. Subject A27 adopts an entirely different attitude, increasing greatly the number of fixations per line. Subject A35 does not seem to be seriously affected by the oncoming demand for questions.

Table XI suggests a great many practical questions. Under our system of teaching, a large part of the pupil's reading is done under the stimulus of an explicit statement from the teacher that questions are going to be asked, or at least under the stimulus of a lively expectation of questions.

TABLE XI

RECORDS OF HIGH-SCHOOL STUDENTS UNDER VARYING CONDITIONS OF EXPECTANCY OF QUESTIONS

Subject	No Expectation of Questions		Expectation of Questions	
	Average Number of Fixations per Line	Average Duration of Fixation Pauses	Average Number of Fixations per Line	Average Duration of Fixation Pauses
A31	6.6	5.4	7.5	6.6
A19	8.0	4.1	7.6	5.9
A22	5.7	6.5	5.6	6.7
A35	7.8	5.4	7.6	5.1
A27	6.4	5.7	9.3	6.1
A28	7.1	5.9	8.7	6.0

What is the psychological effect of combining with the process of reading this forward look toward questions?

It is safe to say that in the minds of most students the expectation of questions does not lead to any well-ordered plan of attack on the content of the passage read. There is probably little more than a vague feeling of anxiety, a kind of restless distraction arising from the idea of tomorrow's recitation and its dangers.

Even when students are fully aware of the necessity of preparing for questions, they usually do not know what to do. They have never been trained to ask themselves intelligent questions. This is proved by the fact that when an ordinary high-school class is invited to ask questions on the lesson they sit dumb and ashamed. Their past training in the matter of questions is that the teacher draws out of the depths of his own pedagogical preparation those queries which no student seems to be prepared to meet. How one formulates a question, or how one gets ready to meet questions, usually remains a bewildering mystery, so far as the student is concerned.

The student, thus untrained for his task, may, and often does, try to fix his mind on everything. Sometimes he divides the reading matter into smaller bits than usual, looks at each word, and tries to get the passage sufficiently stamped on his mind so that when the demand comes he may produce the required words. At other times, instead of taking up the passage in bits, the student looks a little longer at each word. In some cases, no doubt, this longer looking is accompanied by an inner articulation of the word in the effort to memorize it for the recitation.

If the school is going to hold over the student the expectation of questions, ought it not to train him in methods of meeting its demands? Ought not the teacher to tell the class how questions are made up and then discuss the matter somewhat as follows? "In preparing for the next recitation you can anticipate practically everything I am going to ask if you will think about the purpose of the passages in the text. You need not try to learn the text word for word. You need not say the sentences to yourselves. Indeed, if you will read the material through rapidly and think about it and then read it over again rapidly, you will make a double gain, because you will cultivate habits of fluent reading and will, at the same time, gain time for thoughtful consideration of the matter under discussion."

When one sees the utterly unstandardized results exhibited in such tables as have been reported thus far in this monograph, one cannot escape the conviction that pupils have been left to work out their own devices of meeting the demands imposed on them in preparing their lessons through reading. One cannot escape also the conviction that there is a deplorable conflict between reading and study rather than a wholesome adjustment of reading to the complex demands which come in the higher forms of reading. There is a striking slowing-down of reading with every demand that savors at all of careful reading. It is only the passage of fiction and the easy narrative read without directions which seem to go forward with reasonable expedition. The serious forms of reading require from seven to ten fixations per line. This number of fixations indicates, beyond question, clumsy or at least laborious reading. When one considers the number of fixations that would be saved in an hour of reading if the average could be reduced even by so little as one-half a fixation per line, and when one recalls that reduction of the number of fixations is the most common effect of increased training, one can hardly refrain from criticizing severely the schools which neglect to give lessons in silent reading.

One of the authors of this monograph has shown in an earlier work[1] the present averages of achievement in school reading. It is not out of place to follow that discussion with an urgent plea for improved methods that will reduce the averages. The present study has shown that not even the averages are maintained when careful reading rather than mere reading is demanded. There is double reason, therefore, for the plea that careful reading be made more fluent through systematic training.

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[1] Guy Thomas Buswell, *Fundamental Reading Habits: A Study of Their Development*, Supplementary Educational Monographs, No. 21. Chicago: Department of Education, University of Chicago, 1922.

CHAPTER IV

ANALYTICAL STUDY AS DISTINGUISHED FROM READING

This chapter presents a series of facts which show that there are many kinds of mental processes which may be aroused in the presence of a printed page that ought not to be classified as reading. Thus, it will be shown that when a student is asked to pay attention to grammatical facts he is no longer left free to read. He is set a task of analytical study so engrossing that his mental attitude and his whole performance must be recognized as something other than mere reading. In a somewhat less striking degree the student who is asked to give attention to the vocabulary of a passage turns away from the subject-matter and, in so far as he does this, gives up reading.

The cases discussed in the following pages differ from those described in earlier chapters. In the second chapter the character of the subject-matter was varied. There was, however, no demand made on the reader except the demand that he understand the meaning of each passage. To be sure, some passages required more concentration and effort, but the mental process involved was strictly a reading process. In like fashion, the cases discussed in the last chapter, although they exhibited certain changes in the reader's attitude, never got away from the primary purpose of extracting meaning from the passages. Direct attention to subject-matter is characteristic of all of the cases discussed thus far.

The type of complication to which we now turn is illustrated in its most rudimentary form by oral reading. A person who is reading out loud is not attending wholly to the subject-matter of the passage. He is carrying on, at the same time that he is trying to extract meaning from the printed page, a complicated motor process which requires some conscious supervision. If the demand for clear enunciation becomes a little more exacting than usual, there may be so much withdrawal of attention from the subject-matter of the passage that the reader will be thrown into an attitude of mind which is only secondarily the attitude of understanding the meaning.

Another example of departure from the direct reading process can be drawn from a study of proofreading. Close attention to certain formal characterisitics of printed matter may become so much a matter of major interest that the critic of proof will get none of the content of the sentences which he scans.

The high school avoids most of the distractions which arise from oral reading and proofreading but often puts the greatest emphasis on matters of vocabulary and rhetorical form. In some cases the emphasis on rhetorical form is of a type which may be described as unintentional. The student is given a textbook which is written with long, abstract sentences which are so far beyond his grasp and the scope of his attention that he falls back to a consideration of mere words. Sometimes passages contain so many new and unfamiliar words that the student never gets beyond the most formal consideration of these words. It is, of course, utterly out of accord with the facts to say of a student under such conditions that he reads his lessons. He must be described rather as stumbling through a mass of words. It does not correct the situation at all that the author of the textbook and the teacher can read the assignment. Both author and teacher may have intended that the student should read, but the fact remains that the mental processes induced in the presence of many a textbook assignment are not those of reading.

In addition to the unintentional distractions put in the way of a high-school student's reading, there are other distractions which come with the fullest sanction of the teacher. The high school prides itself on being the home of rhetoric. The niceties of expression, the choice of the most suitable words, the fundamentals of grammatical structure are very often put before meaning in the study of English classics and in the translation of foreign languages. A very large fraction of every high-school student's waking hours is devoted to highly analytical literary studies which side-track him from reading.

What has been said is not intended at all to be a general denial that analytical studies may be, and often are, useful. The purpose of the discussion is to bring out with all clearness a distinction. As was pointed out in the introductory chapter, where a clear-cut distinction can be established between certain classes of mental activities, the practical methods of the school will have to be adapted to these distinctions. Therefore, when a distinction exists between rhetoric and reading, it is highly important for practical school purposes that this distinction be fully understood. Then, if it is decided for any reason to cultivate rhetoric, the methods of teaching can be properly directed toward this end. If, on the other hand, it is decided in some other case that content is the chief concern, then the method adopted should reflect this choice.

The concrete cases which were worked out in this study do not by any means exhaust the possibilities. It is hoped that the examples chosen will be regarded as mere sample cases and that the distinctions which they establish will be carried much further by those who have to devise methods of meeting the problems of high-school teaching.

The experimental procedure in this part of the investigation was to secure a series of narrative passages, all made up of simple words and short sentences and all making about the same demands on the reader's training. The material finally chosen was taken from the introductory paragraphs of the story of Aladdin in the *Arabian Nights*. Each reading exercise was composed of from seven to nine lines, and the successive passages carried forward the narrative so that the reader had all of the advantages which could be derived from continuity.

Before the photographs of a given reader's eye-movements were taken, he was introduced to the general style of the passages which were to be used by being asked to read a page from a section of the story later than that from which the experimental material was taken. When the preparatory reading was finished, the subject was asked to read out loud a first passage. He was given no special directions but was allowed to adopt his own natural rate and attitude of oral reading.

The first passage was as follows:

> Once upon a time a tailor, by the name of Mustapha, lived in one of the wealthy cities of China. He was so poor that he could hardly support himself and his family, which consisted of a wife and son. His son, who was called Aladdin, was a good-for-nothing, and caused his father much trouble, for he used to go out early in the morning, and stay out all day, playing in the streets with idle children of his own age.

At the close of the reading the subject was asked two questions: "In what country is the scene of this story laid?" and "How many members were there in the family about whom the story is told?" The purpose of the questions was to influence the later reading. As was shown in Chapter III, the attitude of preparing to answer questions is one which results in an increase in the number of fixations and in the average duration of fixation pauses. It was deemed wise to raise all of the subsequent performances in this section of the investigation to this level of increased number of fixations. The reading to be reported in this chapter involves, accordingly, first, the effort to be ready to answer questions and, in addition, the other types of effort which are the special subjects of investigation and are to be classified as forms of analytical study.

The next step, after securing a record of the oral reading of the first passage and arousing the expectation of questions, was to ask the subject to read a passage silently. Again, no special directions were given. The subject was, however, induced, by the questions asked after the first passage, to read slowly and carefully.

The second passage was as follows:

> When Aladdin was old enough to learn a trade, his father took him into his own shop, and taught him how to use his needle, but to no purpose; for as soon as his father's back was turned, Aladdin was gone for that day. Mustapha punished him. But Aladdin did not improve, and his father was so much troubled that he became ill, and died in a few months.

At the conclusion of the reading the subject was asked, "What kind of a boy was Aladdin?" and "What did Aladdin's father do to him?"

The subject was by this time well in the spirit of the narrative and was well established in the attitude of answering questions. The third passage continued the narrative, as follows:

> Aladdin, no longer under fear of his father, gave himself entirely over to his idle habits, and was always on the streets. This course he followed till he was fifteen years old, without giving his mind to any useful pursuit. As he was one day playing in the street, with his vagabond associates, a stranger passing by stood and watched him closely. The stranger was an African magician, and had been but two days in the city.

Before this passage was presented, special directions were given in the following words: "The next passage is to be read silently. When you are through, please try to recall enough of the words and phrases to tell me three words which are not altogether common in everyday conversation."

The purpose of these directions was to turn the reader's attention to the vocabulary of the story. It was not intended to introduce a distraction serious enough to withdraw attention altogether from the narrative, and the reader was not told anything about the purpose of the experiment. It is believed that all of the conditions were enough like those of the ordinary school experiences of the pupils so that they thought of the directions given them as similar to the ordinary directions given in the English class.

At the conclusion of the third reading the subject was asked the single question, "How old does this passage say Aladdin was?"

The fourth passage was as follows:

> The African magician, seeing that Aladdin was a boy well suited for his purpose, made inquiries about him; and, after he had learned his history, called him aside, and asked him about his father. Aladdin told him about his father and in the end told him also that his father was long since dead. At these words, the African magician threw his arms about Aladdin's neck and kissing him with tears in his eyes said, "I am your uncle."

The directions were: "Please read the next paragraph out loud and pay particular attention to correct pronunciation and good emphasis." The purpose here was to center attention on the sound characteristics of the passage and thus to secure in some measure the oral counterpart of the emphasis on novel and unfamiliar words which was sought in the preceding stage of the experiment.

The question at the conclusion of this reading was: "What did the magician ask Aladdin?"

The fifth passage was as follows:

> Then he gave Aladdin a handful of small coins and told him to go to his mother and tell her that he would visit her tomorrow. Again, the next day, Aladdin's uncle found him playing in another part of town, and embracing him as before, put two pieces of gold into his hand, and said to him: "Carry this, child, to your mother, tell her that I will come and see her tonight, and bid her get us something for supper; but first show me the house where you live."

The directions were: "Read the next passage to yourself and, when you have finished, dictate to the phonograph everything you can remember." At the conclusion of this reading no questions were asked because the dictation supplied evidence of careful reading.

The purpose of this fifth reading was twofold. It served, together with the questions that had been asked, to keep the reader constantly alert to the meaning of the passage. This was regarded as essential to the experiment throughout. As stated in an earlier paragraph, the level of the whole performance was raised high enough so that no errors of interpretation of results could arise from effects due to careful, slow reading. The second purpose of this very simple direction in the middle of the series was to see whether explicit reference to content would bring out any sharp contrasts with the preceding and subsequent records. It is to be supposed that up to this point the reader was able to give much attention to content in spite of the distractions, but he had not been explicitly told to emphasize content. This passage gives a basis of assurance that we know the extreme effect of emphasis on content.

The next exercise was introduced by directions and a demonstration. The subject was asked to paraphrase the passage shown him. He was told to dictate his paraphrasing to the phonograph. In order that he might know what was wanted, he was shown the first line of the paragraph and, below it, a sample of the kind of paraphrasing that he was asked to make. The demonstration lines were as follows:

Aladdin showed the magician the house.
The boy pointed out to his supposed uncle where he lived.

After the experimenter felt sure that the requirements were understood, the full passage was exposed, as follows:

> Aladdin showed the magician the house, and carried the two pieces of gold to his mother, and when he had told of his uncle's intention, she went out and bought food, and borrowed dishes from her neighbors. She spent the whole day in preparing the supper; and at night, when it was ready, said to her son: "Perhaps your uncle will not find the way to our house; go and bring him with you if you meet him."

It may be said, in anticipation of the final results, that paraphrasing turned out to be a most formidable task. Evidently the pupils—all of whom were studying a foreign language and had more or less facility in translation—had no training of a kind to prepare them for this task.

Following the paraphrasing, a grammatical problem was presented. The passage to be read was printed in the usual type, except that certain verbs were printed in bold-face type. The passage was as follows:

> Aladdin was ready to **start**, when the magician came in **loaded** with wine, and all sorts of fruits for dessert. After the African magician had **given** what he brought into Aladdin's hands, he saluted his mother, and desired her to **show** him the place where his brother Mustapha used to **sit** on the sofa; and when she had so **done**, he **bowed** his head down, and kissed it.

Before the passage to be read was exposed, the student was told that some of the verbs would be printed in heavy type. He was asked to read the passage to himself and to pick out the verbs which had objects; these he was to pronounce into the phonograph.

The series of readings reported in this chapter closed with a passage which the subject was asked to read carefully to himself and to repeat word for word to the phonograph. The passage was as follows:

> Then the magician sat down and began to talk with Aladdin's mother: "My good sister," said he, "do not be surprised that you have never seen me during all the time you have been married to my brother Mustapha. I have been forty years absent from this country; and during that time have traveled in many lands until finally I settled in Africa."

The purpose of these directions was to check once more the complete understanding of what was read and to secure a record of the effect of a demand for word-for-word reproduction as contrasted with the earlier, vaguer demand, "report everything you can remember."

Complete and usable series of records were secured from five subjects. These were students from three high schools. Four were rated as superior, one as weak. They were from the Junior and Senior years of the high school and in one case, A28,[1] from the first year of a junior college connected with a high school. Their records in reading and their school records show them to be a typical superior high-school group.

The findings reported in earlier chapters justify the belief that general averages will be of less value in the study of such complex forms of reading as are here under discussion than will be the careful comparison of the records of a single individual. We turn, therefore, to a consideration of the individual tables.

In the performances of Subject A23 it is noticeable that all of the simpler forms of reading, that is, the types of reading numbered 1, 2, 5, and 8, in Table XII, show average durations of fixation pauses which hold fairly close to the minimum commonly found.

The adjustments for these simpler forms of reading are made almost exclusively in the number of fixations per line. This means that Subject A23, when confronted with any simple task, is able to recognize each unit to which she gives attention in a period of time which proves that she is highly trained in word-recognition. If the situation grows at all complex, she tends to cut down the unit which she tries to grasp.

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[1] The subjects whose records are used in this chapter and the next are distinguished from those whose records are discussed elsewhere by the use of the letter A in connection with a serial designating number.

There is a close resemblance, too, among the various simpler readings in respect to the number of fixations per line. The most radical departure from this rule is in the number of fixations for the first oral passage. The large number of fixations here is impressive because it exceeds the number of words per line. The large number of fixations in this first record may be due to the fact that the reader was getting started and had not yet become immersed in the narrative.

In the cases where special directions were of such a character as to draw the attention of the subject in some measure away from the content of the reading matter, namely, in the passages where attention was called to peculiar words, emphasis on enunciation, paraphrasing, and verbs, the duration of fixation pauses was such as to prove that some mental process was going on which was other than simple reading. Consciousness is dwelling on each unit of experience, seeking some content additional to that presented to the eyes.

TABLE XII

RECORD OF SUBJECT A23 IN VARIOUS TYPES OF READING AND ANALYSIS

Types of Reading and Analysis	Average Number of Fixations per Line	Average Duration of Fixation Pauses
1. Simple oral	14.1	5.4
2. Silent—questions	11.8	5.0
3. Peculiar words	12.8	6.3
4. Emphatic oral	12.0	6.8
5. Silent—dictate ideas	11.4	5.2
6. Paraphrase	48.0	9.0
7. Verbs	12.2	6.0
8. Silent—verbatim	12.0	5.3

Paraphrasing is unique in all respects. In almost every instance Subject A23 makes long fixation pauses. Some of the pauses are long enough to justify the inference that the subject is quite lost in her efforts to get phrases and, consequently, fixates a point without attention to the word fixated while searching around in consciousness for some synonym for the phrase already recognized. In addition to the abnormal length of fixation pauses, the paraphrasing example shows a number of fixations so extravagant as to prove that the subject's problem was by no means one of recognition. The excessive number of pauses represents a wandering of the eye around the page while consciousness attempted the discovery of words to fill the demand. This wandering of the eyes must have brought to the subject a bewildering mass of visual experiences which complicated enormously the processes of thought.

Since the conventional method of exhibiting eye-movements does not seem adequate in depicting the successive stages of behavior while a pupil is paraphrasing, a new type of representation is presented. Plate 21[1] shows the record of fixations for a single line of paraphrasing in the form used in earlier portions of this monograph. Plate 22 is the new form of representation and gives at successive levels a statement of what was immediately in the eye of the observer at the various fixation pauses. It is not possible to determine exactly what was in the reader's eye, because we do not know definitely the range of clear vision. It is in keeping with the general evidence which has been accumulated in regard to the range of vision to assume that a subject sees clearly five or six isolated letters and possibly twice this number when the letters form familiar words. It is quite certain that in many cases the subject does not fully take in so large a number of letters. We may, however, for the sake of not underestimating the content of vision, assume that the subject sees ten letters at each fixation. The space between two words may be counted as equivalent to a letter. Furthermore, it will be observed if one introspects his experiences in looking at a line of printed matter, that one sees more clearly the letters at the right of the center of fixation than the letters at the left. This plate and subsequent similar plates are accordingly made up in such a way as to include for each fixation four letters to the left and six to the right of the point of fixation. The successive stages of visual apprehension of the line are represented by dropping the record to a new level with each movement of the eye forward or backward. The vertical distance between two successive levels representing successive fixations is made proportional to the time during which the eye remains at a single fixation. Typewritten letters, instead of printed letters, are used in making up the plates for motives of economy, and the whole record is much reduced in scale so as to crowd it on a single page.

Plate 23 shows, for purposes of comparison, the visual impressions received during the reading of two typical lines of the second passage by Subject A23 while reading silently according to her own devices. The only complication here was that she expected questions.

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[1] The dotted lines at pauses Nos. 29 and 30 indicate that the eye left the line altogether and fixated points above.

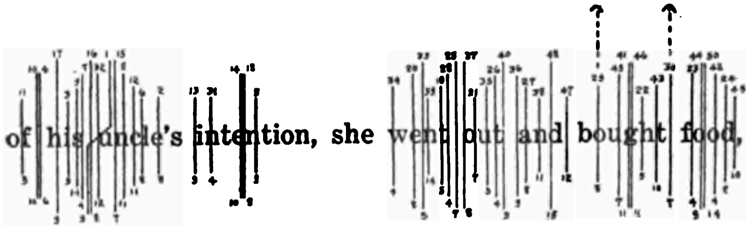

Plate 21.—Record of the eye-movements of Subject A23 while attempting to paraphrase a line.

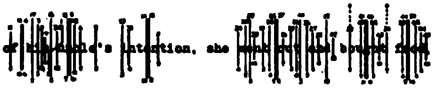

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PLATE 22.—The same record as in Plate 21, arranged so as to show visual content of successive fixations.

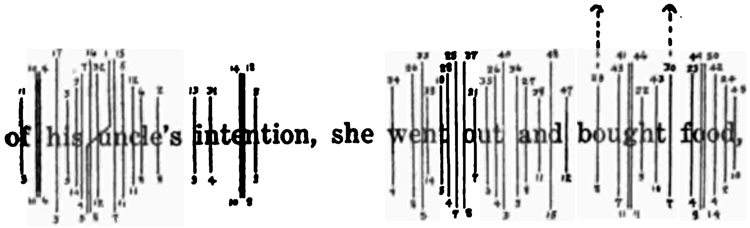

PLATE 21.—Record of the eye-movements of Subject A23 while attempting to paraphrase a line.

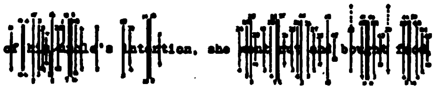

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PLATE 22.—The same record as in Plate 21, arranged so as to show visual content of successive fixations.

It is more evident from the observation of these records than from the tables that paraphrasing cannot properly be called a form of reading. Reading is undoubtedly involved. The subject must get the ideas from the printed page. It sometimes looks, for short intervals, as though the subject were reading in a normal fashion and then, having covered a short sentence, she drops back into aimless wandering of the eyes while she seeks in her thoughts for phrases which she can use to express the idea gained in the momentary reading. Such an episode appears when she reads the words "she went out and bought food" as shown in fixations 20 to 24 in Plate 21.

The chief point to be made is that the process of paraphrasing, taken as a whole, is not a form of reading.

Guided by the clue secured in dealing with paraphrasing, we may turn to some of the other complex processes. Plate 24 shows what Subject A23 does in looking for transitive verbs. There is here a perfect picture of analytical movement. The eye moves forward and gives opportunity for the subject to take in a few words and then turns back while the subject rescrutinizes the words for purposes of seeing whether they are of the type to be selected. This analytical movement is conspicuous in the immediate neighborhood of a verb where, of course, the problem of selection is crucial.

Again, it is evident, though perhaps less impressively so than in the case of paraphrasing, that the subject is not reading. She is making an analysis of the reading matter. This analysis is predetermined in character by the purpose of selecting transitive verbs, and the movement of the eyes accordingly takes on a special character at the point where the observation of verbs is made.

The practical lessons which issue from this study of grammatical analysis and its nature are of profound significance for the school. If one asks about the directions which teachers give the pupils in most of the exercises of the school for the purpose of controlling their reading, one finds that a very large fraction of the reading is, in fact, looking for something on the printed page. Looking for something is doubtless very different in different cases, but it is always more or less of an analytical matter and, just in so far as the mental process becomes analytical, it departs from the typical behavior of reading.

It is altogether probable that the constant emphasis of the schools on analytical reading may set up a general tendency in the mind of the pupil to feel that he is not doing his duty by a book unless he is perusing it slowly and laboriously and in a fashion which aims to find something

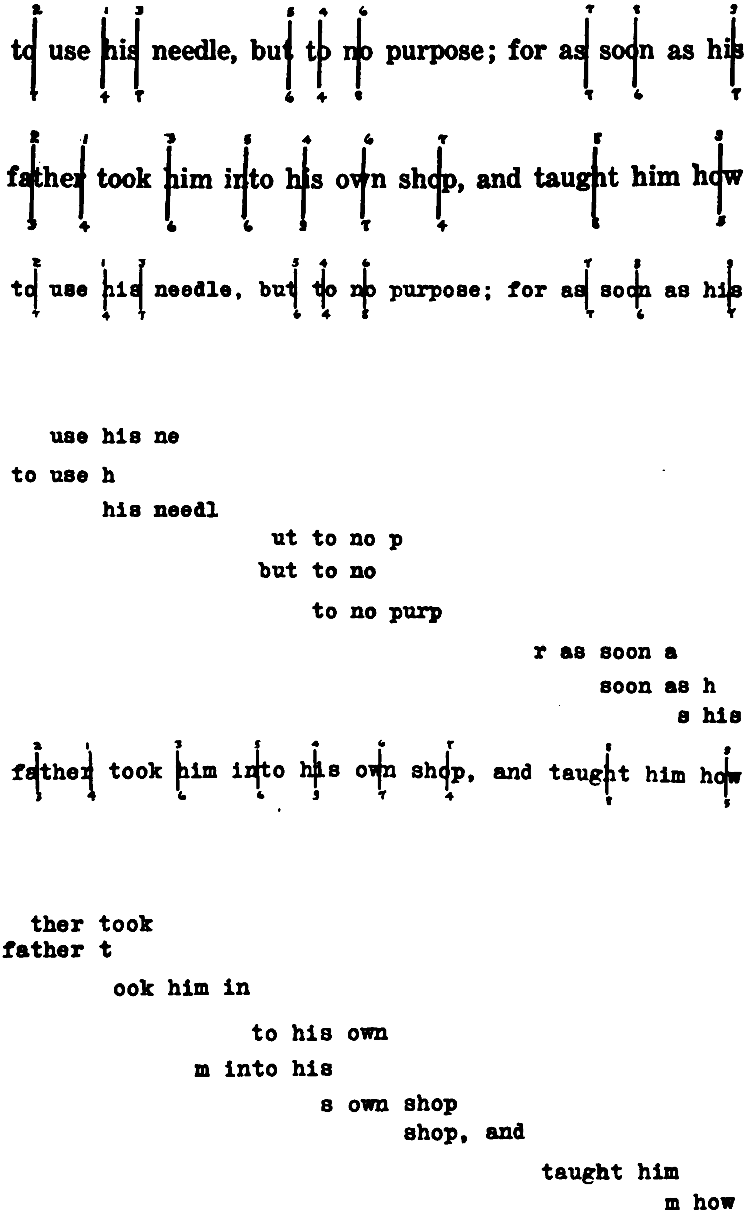
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PLATE 23.—Two typical lines from the record of Subject A23 reading silently without analysis.

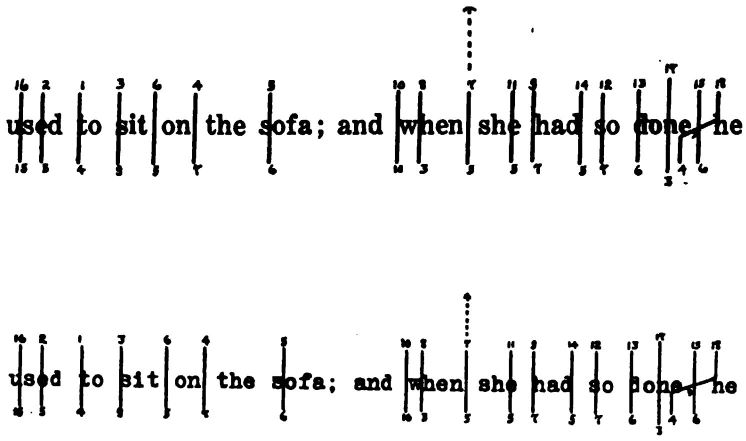
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PLATE 24.—Record of Subject A23 in making grammatical analysis

in the passage other than the straightforward meaning. Most schools assign lessons of such brevity as to make it clear that pupils are not expected to do much reading. The time is then occupied in class in searching every nook and corner of the line for curious rhetorical or historical intricacies. In the meantime, the valuable habit of reading in a straight-ahead fashion suffers by disuse and by a series of involved distractions which bring into the reader's experience almost every other possible form of thinking.

Returning from these suggestions as to the practical significance of the study of analytical forms of reading, we may take up a scrutiny of another record taken from Subject A23. Plate 25 shows the way in which the third passage was read by this subject when she was told to look for peculiar words. There is in most of the lines less of the moving backward and forward than there was in the records of paraphrasing and grammatical analysis, but there are clear traces of analysis even here. Especially striking are the evidences of analysis in the lines beginning "As he was" and "closely." Plate 26 exhibits in detail the line beginning "closely."

Plate 27 continues the search for traces of analysis by presenting a part of the record made when Subject A23 was directed to attend to the clear enunciation of the words and phrases. This plate does not represent adequately all of the facts which come out when the photographic record is examined. Laboratory experience with photographs of eye-movements makes it possible for the experimenter to determine by inspection when he is dealing with any form of oral reading as distinguished from any form of silent reading. Oral reading is always accompanied by head-movements which complicate the record. The head of the reader is held by various clamps and braces in as nearly a fixed position as possible, but as soon as the reader begins to articulate the braces prove incapable of holding the head, because the whole muscular system is brought into sympathetic action.

The general nervous commotion which accompanies oral reading of every kind is exaggerated when the reading is unusually exacting. Such was the case when the subjects were told to give special attention to pronunciation and enunciation.

It may be remarked in passing that head-movements appear also under conditions of difficult silent reading. As soon as a subject finds it difficult to understand a passage for any reason, there appear general signs of muscular agitation, and these are recorded in the photograph as head-movements.

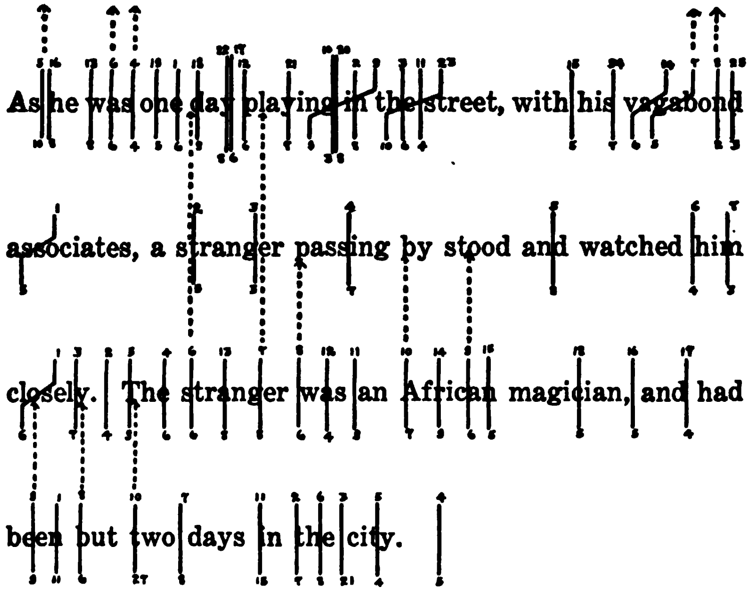
As he was one day playing in the street, with his vagabond
associates, a stranger passing by stood and watched him
closely. The stranger was an African magician, and had
been but two days in the city.

Plate 25.—Record of Subject A23 reading silently and analyzing the passage for peculiar words.

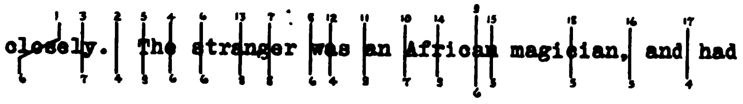

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PLATE 26.—Rearrangement of the record of the third line shown in Plate 25

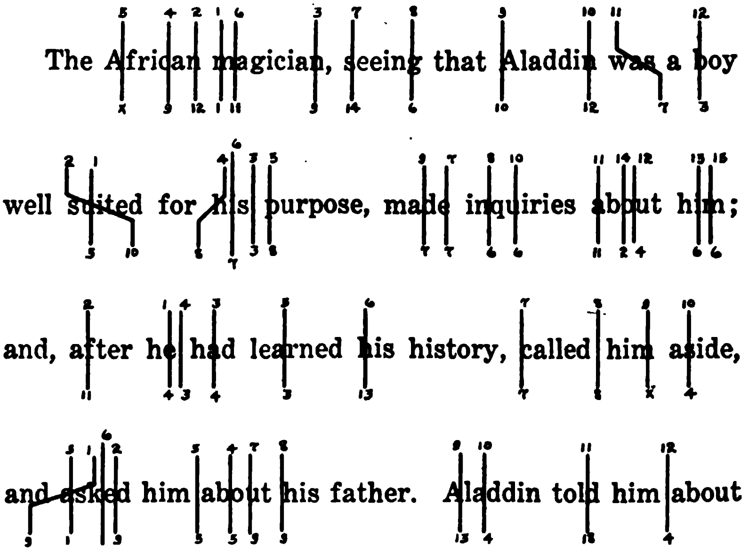
The African magician, seeing that Aladdin was a boy
well suited for his purpose, made inquiries about him;
and, after he had learned his history, called him aside,
and asked him about his father. Aladdin told him about

PLATE 27.—Record of Subject A23 reading orally and attending to clear enunciation.

The record shown in Plate 27 exhibits not only the head-movements that indicate general agitation and the numerous fixations which are characteristic of oral reading, but also some traces of the backward and forward movements which are characteristic of the analytical attitude.

We are now in a position to describe the type of behavior which is present when the subject is attempting an analysis of the printed page. The gross fact is that analytical study of a page is slower than ordinary reading. The slower reading is due in part to the fact that there are more fixations per line than would have been required even for attentive reading. Furthermore, these frequent movements lack the simple progressive direction which is characteristic of fluent reading. There are many regressive movements, and the regression often exhibits several steps. Sometimes the eye moves back two or three steps or moves back and forth across the same point in several movements. The pauses at each fixation are also increased in length above the minimum of expert recognition. The longer fixation pauses evidently mean a mental effort on the part of the subject to call up experiences that will illuminate in some additional way the passage being read.

There is doubtless some analysis of a simple type present in all immature reading. It is a striking fact that regressive movements are very common with immature readers. Long fixation pauses are also characteristic of immaturity. When these analytical symptoms appear in the reading of little children we usually tolerate them, because we consider the process of learning to read as a succession of efforts, some of which will not succeed because they are misdirected. When, accordingly, a child stops and makes a backward movement, we think of it as an exceptional effort to overcome a difficulty. We think of the reading process as in the making. When, on the other hand, a mature reader is drawn back into these undesirable forms of behavior while he is trying to read, we cannot accept the irregularities with complacence because they show a disintegrating tendency.

There are, indeed, conditions under which we can think of even a mature reader as making an effort to acquire fluent successful reading through a period of analytical, cumbersome activities, as, for example, when he encounters a detailed series of symbols in an algebraic formula or a passage full of new and strange words. But in such cases the mature reader shows his maturity by avoiding, for the most part, backward and forward movements, or by deliberately adopting some device other than reading to extricate himself from the difficulty. For example, when such a reader encounters a new word, instead of hovering helplessly around it, he resorts to a dictionary.

Such a consideration of the contrasts between different types of reading leads directly to numerous pedagogical maxims. First, teachers ought to know in every case what they are teaching. Thus, the teacher of literature ought to know whether she wants her students to read belles-lettres or to make analyses of the text with the aid of references to the classical dictionary. Second, teachers should know what method of training to adopt if they want pupils to cultivate certain classes of habits. For example, it is folly to expect the type of reading which leads to literary appreciation during an elocutionary exercise in which the chief channels of nervous excitement lead to the vocal cords. Third, teachers should understand that reading habits set up under conditions which constantly and repeatedly demand elaborate grammatical analyses are not likely to be productive of fluent, progressive reading.

From the foregoing sketch of the reading habits of Subject A23 and the general discussion of inferences based on this subject's records, we turn to the consideration of the records of the other four subjects included in this series. These records confirm fully the contrast which has been drawn between reading and analysis. It will be well, however, to reproduce a number of typical lines from the various records so that the reader of this monograph may form his own judgments. Comparison of the records of all of the subjects brings out also the sharp contrasts between individuals.

Perhaps the simplest way of presenting the material is to give the full tables and to comment on a few of the outstanding conclusions which can be based on them and then to consider a number of detailed records. Tables XIII–XVI are similar in form to Table XII.

Among the special points of interest in the records of Subject A27, exhibited in Table XIII, are the marked increases in the number of fixations in all of the analytical processes. Looking for peculiar words seems to be for this subject a painstaking analysis of each line. Plate 28 shows a sample line. Grammatical analysis also seems to be for this subject a most distracting undertaking. Plate 29 gives an example.

In sharp contrast with the labored efforts in analytical processes this subject evidently experienced great relief when he came to the demand that he read for dictation of ideas. Evidently this impressed him as a type of exercise entirely familiar and directly comparable to the ordinary demands of the school. For him this type of reading is simpler than the slow, careful reading which he felt compelled to do in the second exercise when questions of unknown import threatened. Plate 30 gives a few lines of the record of silent reading of the type numbered 5 in Table XIII.

While reporting what he read was a familiar task taken up lightheartedly by this subject, the business of preparing to repeat verbatim was a much more serious undertaking.

One characteristic of the records of analytical reading is that they are very irregular. Certain lines seem to be mastered without great effort. The pauses are few in number and regular in forward progression. Other lines show the greatest complication. Plate 31 reproduces three successive lines in the verbatim record of Subject A27, two of which show a large number of irregular fixations.

TABLE XIII

Record of Subject A27 in Various Types of Reading and Analysis

Types of Reading and Analysis	Average Number of Fixations per Line	Average Duration of Fixation Pauses
1. Simplé oral	9.3	7.6
2. Silent—questions	8.4	6.1
3. Peculiar words	14.9	6.6
4. Emphatic oral	11.7	6.8
5. Silent—dictate ideas	5.6	6.1
6. Paraphrase	29.2	8.5
7. Verbs	20.1	7.1
8. Silent—verbatim	10.1	7.7

TABLE XIV

Record of Subject A28 in Various Types of Reading and Analysis

Types of Reading and Analysis	Average Number of Fixations per Line	Average Duration of Fixation Pauses
1. Simple oral	9.2	6.5
2. Silent—questions	7.1	4.6
3. Peculiar words	8.2	7.4
4. Emphatic words	9.7	7.2
5. Silent—dictate ideas	7.0	5.1
6. Paraphrase	27.4	8.6
7. Verbs	11.4	7.0
8. Silent—verbatim	9.0	8.0

Subject A28, as may be seen in Table XIV, shows fluctuations in the duration of fixation pauses and marked fluctuations in the number of fixations per line. For example, the demand that he repeat word for word leads this subject to look long and deliberately at each word. Plate 32 shows a sample line.

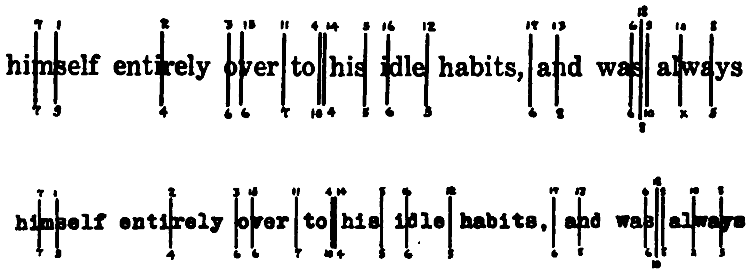
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Plate 28.—A line from the record of Subject A27 reading silently and analyzing for peculiar words.

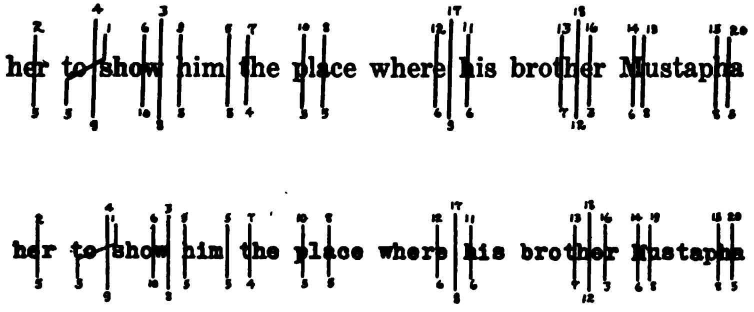
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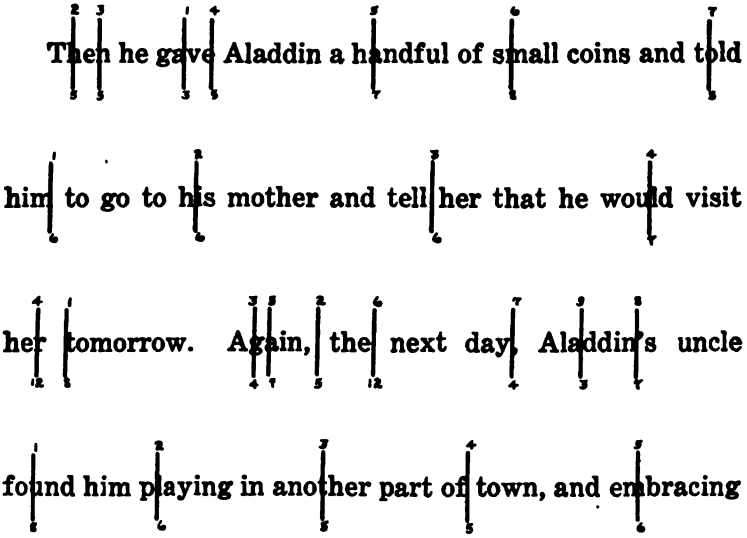
PLATE 29.—A line from the record of Subject A27 reading silently and making grammatical analysis.



Then he gave Aladdin a handful of small coins and told
him to go to his mother and tell her that he would visit
her tomorrow. Again, the next day, Aladdin's uncle
found him playing in another part of town, and embracing

PLATE 30.—Record of Subject A27 reading silently passage to be reproduced

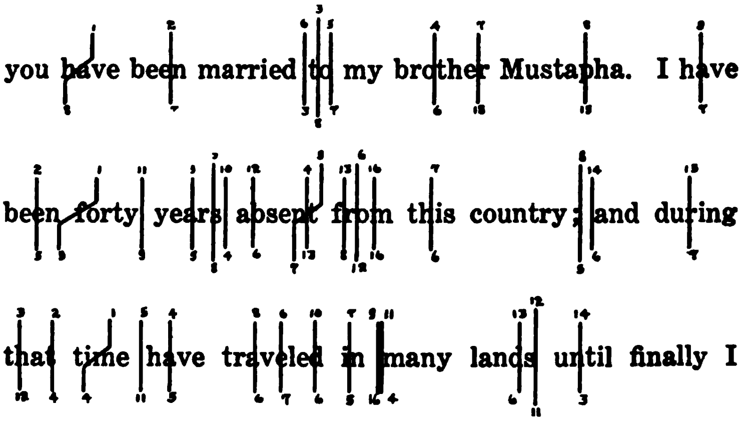

you have been married to my brother Mustapha. I have
been forty years absent from this country; and during
that time have traveled in many lands until finally I

PLATE 31.—Record of Subject A27 reading silently in preparation for verbatim reproduction.

Silent reading to answer questions is a very direct and fully mastered procedure for this subject. A marked contrast appears when one compares the record for such silent reading with the record for grammatical analysis. The two records are shown in Plates 33 and 34.

Subject A28 made fewer fixations in paraphrasing than any of the subjects in this series. Two specimen lines are shown in Plate 35.

Subjects A29 and A31, whose records are shown in Tables XV and XVI, differ from each other in general ability. Subject A31 is reported as a weak student, while Subject A29 is reported as superior. This may be the explanation of the fact that throughout all of her records Subject A31 shows a very large average number of fixations per line, while Subject A29 shows a relatively small average number.

TABLE XV

RECORD OF SUBJECT A29 IN VARIOUS TYPES OF READING AND ANALYSIS

Types of Reading and Analysis	Average Number of Fixations per Line	Average Duration of Fixation Pauses
1. Simple oral	9.6	6.3
2. Silent—questions	7.2	7.3
3. Peculiar words	8.4	7.1
4. Emphatic oral	8.1	7.4
5. Silent—dictate ideas	6.8	6.0
6. Paraphrase	31.4	9.2
7. Verbs	13.2	8.2
8. Silent—verbatim	8.6	7.1

TABLE XVI

RECORD OF SUBJECT A31 IN VARIOUS TYPES OF READING AND ANALYSIS

Types of Reading and Analysis	Average Number of Fixations per Line	Average Duration of Fixation Pauses
1. Simple oral	10.4	4.8
2. Silent—questions	7.5	6.6
3. Peculiar words	10.1	6.7
4. Emphatic oral	12.1	6.6
5. Silent—dictate ideas	9.1	6.4
6. Paraphrase	63.7	9.0
7. Verbs	17.8	7.7
8. Silent—verbatim	10.1	8.3

Subject A29 is especially disturbed by the demand for grammatical analysis. Plate 36 shows a part of his record. It is especially to be

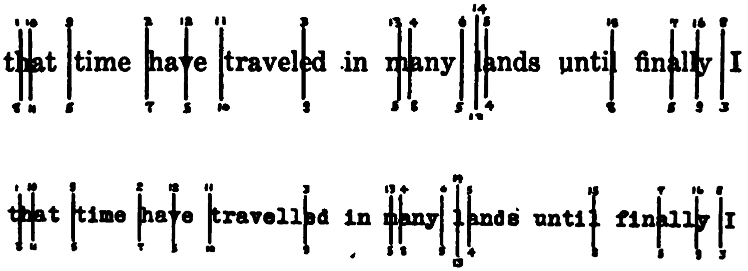

that time have traveled in many lands until finally I
that time have travelled in many lands until finally I

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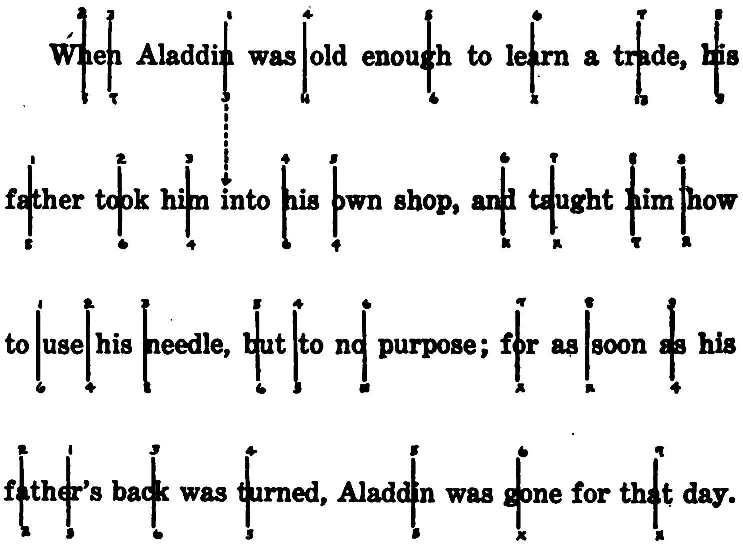
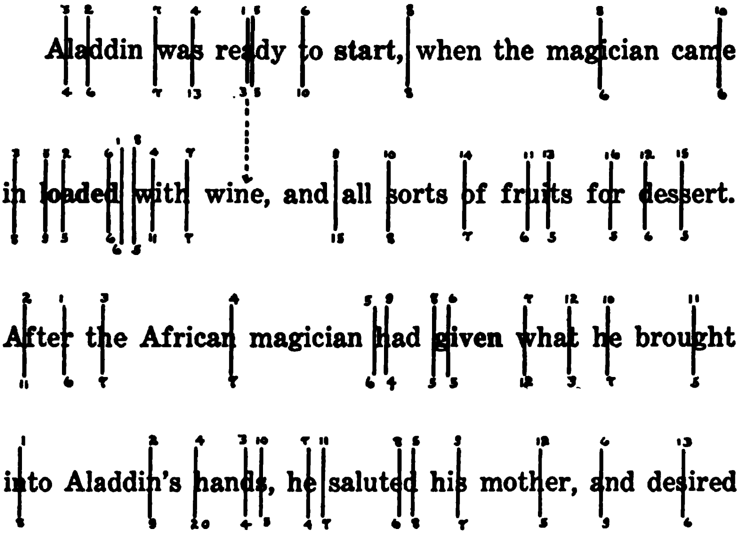
PLATE 32.—A line from the record of Subject A28 reading silently in preparation for verbatim reproduction.



When Aladdin was old enough to learn a trade, his father took him into his own shop, and taught him how to use his needle, but to no purpose; for as soon as his father's back was turned, Aladdin was gone for that day.

Plate 33.—Record of Subject A28. Silent reading without special directions



Aladdin was ready to start, when the magician came in loaded with wine, and all sorts of fruits for dessert. After the African magician had given what he brought into Aladdin's hands, he saluted his mother, and desired

PLATE 34.—Record of Subject A28. Silent reading and grammatical analysis

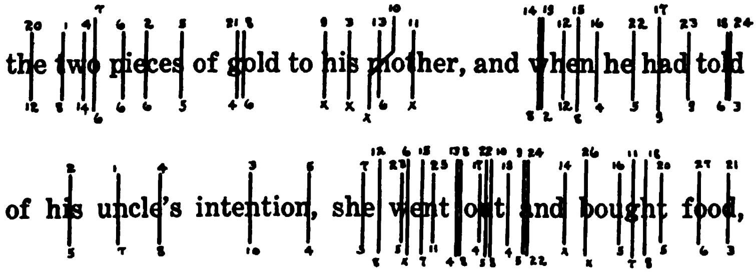
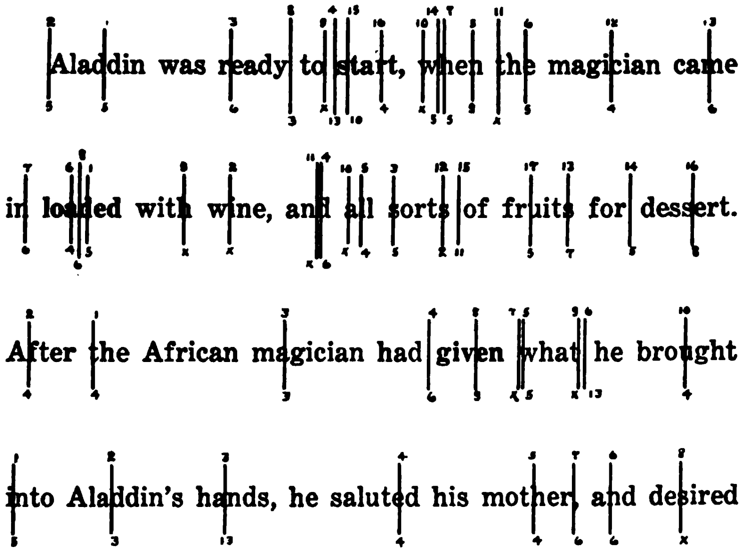

the two pieces of gold to his mother, and when he had told
of his uncle's intention, she went out and bought food,

Plate 35.—Record of the eye-movements of Subject A28 during effort to paraphrase.



Aladdin was ready to start, when the magician came in loaded with wine, and all sorts of fruits for dessert. After the African magician had given what he brought into Aladdin's hands, he saluted his mother, and desired

PLATE 36.—Record of Subject A29 reading silently and making grammatical analysis.

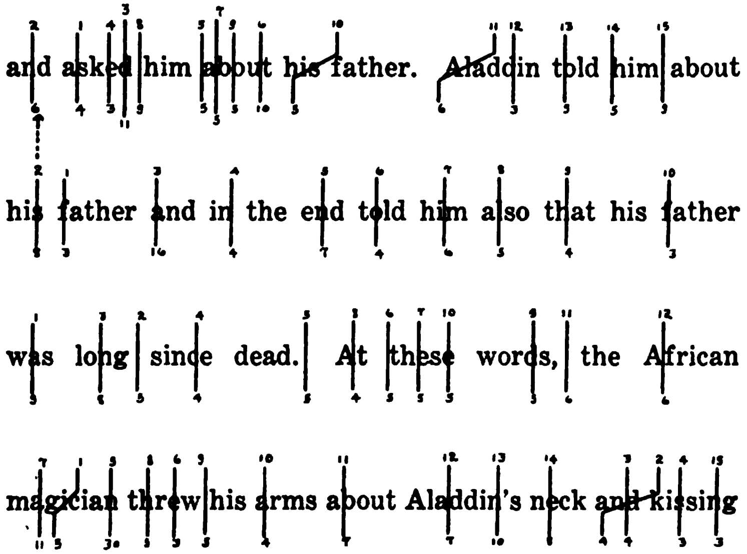

and asked him about his father. Aladdin told him about
his father and in the end told him also that his father
was long since dead. At these words, the African
magician threw his arms about Aladdin's neck and kissing

PLATE 37.—Record of Subject A31 reading orally with special attention to enunciation.

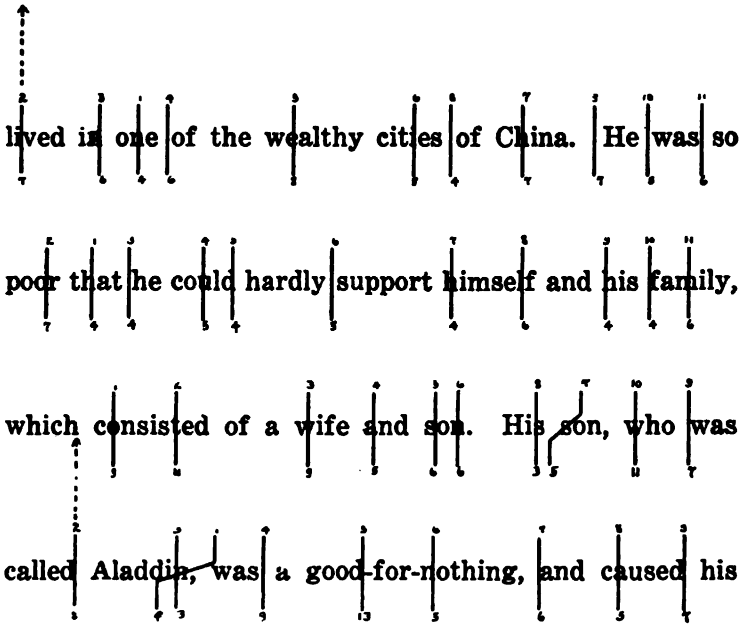

lived in one of the wealthy cities of China. He was so
poor that he could hardly support himself and his family,
which consisted of a wife and son. His son, who was
called Aladdin, was a good-for-nothing, and caused his

Plate 38.—Record of Subject A31 reading orally without regard to special instructions.

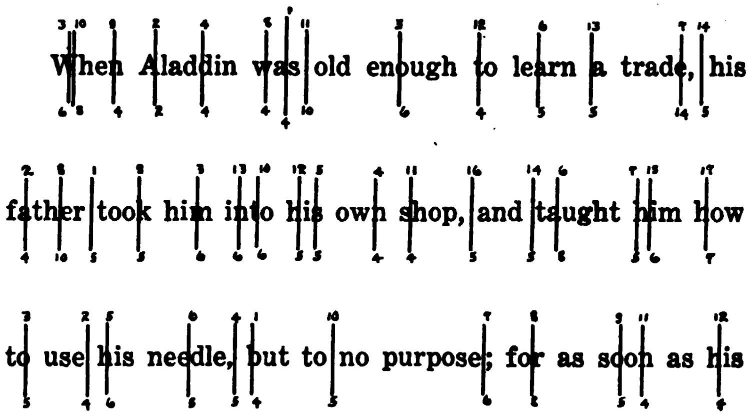

When Aladdin was old enough to learn a trade, his
father took him into his own shop, and taught him how
to use his needle, but to no purpose; for as soon as his

Plate 39.—Record of Subject A20 reading silently without analysis

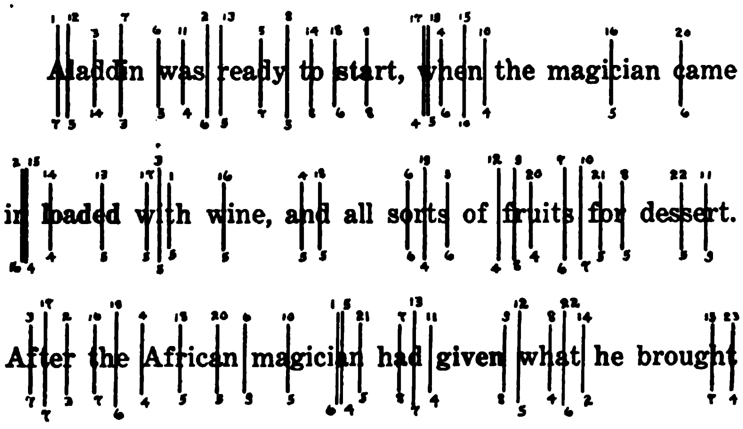

Aladdin was ready to start, when the magician came
in loaded with wine, and all sorts of fruits for dessert.
After the African magician had given what he brought

PLATE 40.—Record of Subject A20 reading silently with grammatical analysis

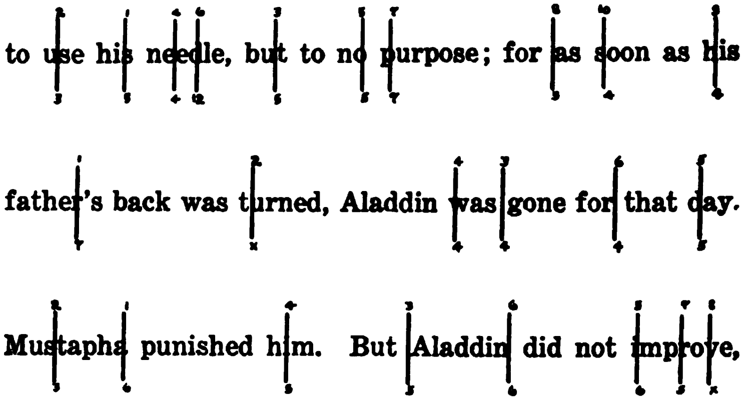

to use his needle, but to no purpose; for as soon as his
father's back was turned, Aladdin was gone for that day.
Mustapha punished him. But Aladdin did not improve,

PLATE 41.—Record of Subject A21 reading silently without analysis

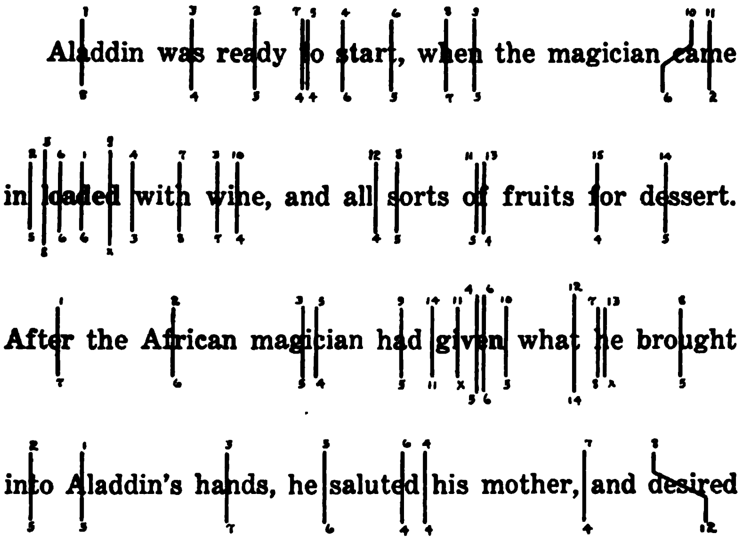

Aladdin was ready to start, when the magician came
in loaded with wine, and all sorts of fruits for dessert.
After the African magician had given what he brought
into Aladdin's hands, he saluted his mother, and desired

Plate 42.—Record of Subject A21 reading silently with grammatical analysis

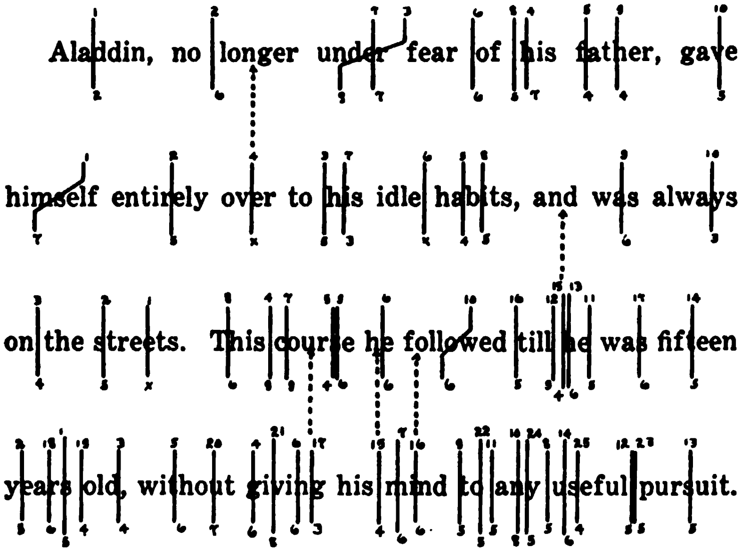

Aladdin, no longer under fear of his father, gave
himself entirely over to his idle habits, and was always
on the streets. This course he followed till he was fifteen
years old, without giving his mind to any useful pursuit.

PLATE 43.—Record of Subject A24 reading silently and analyzing for peculiar words.

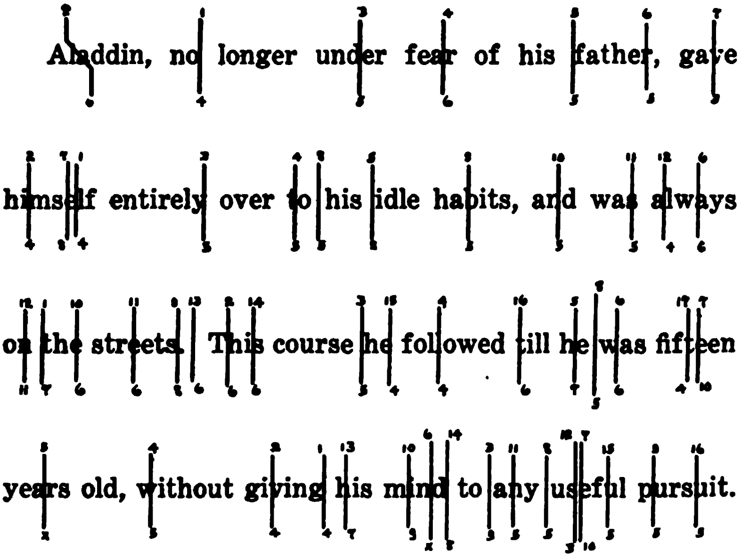
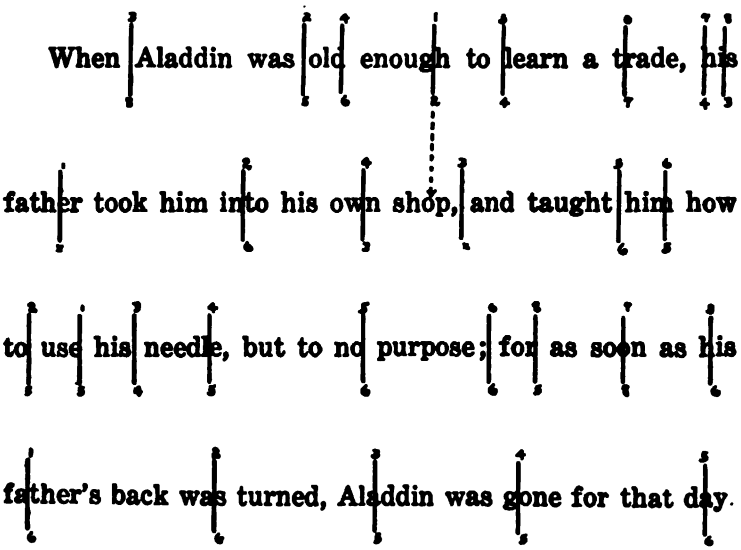

Aladdin, no longer under fear of his father, gave
himself entirely over to his idle habits, and was always
on the streets. This course he followed till he was fifteen
years old, without giving his mind to any useful pursuit.

PLATE 44.—Record of Subject A30 reading silently and analyzing for peculiar words.



When Aladdin was old enough to learn a trade, his father took him into his own shop, and taught him how to use his needle, but to no purpose; for as soon as his father's back was turned, Aladdin was gone for that day.

PLATE 45.—Record of Subject A24 reading silently without analysis

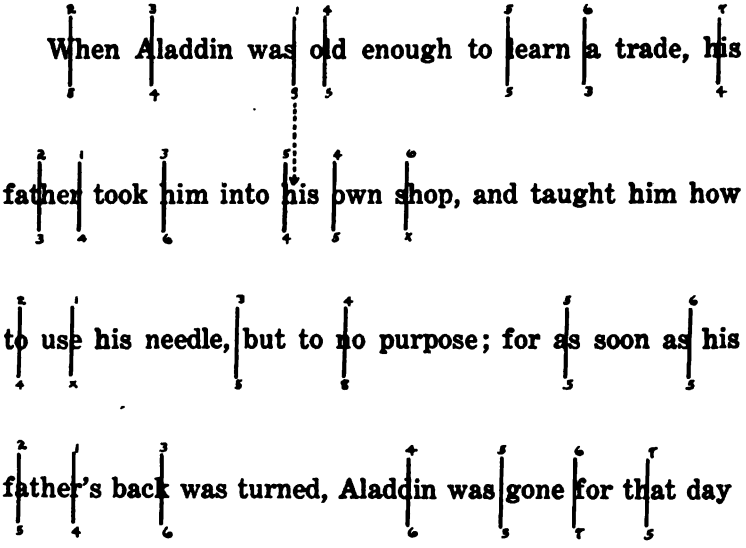

When Aladdin was old enough to learn a trade, his
father took him into his own shop, and taught him how
to use his needle, but to no purpose; for as soon as his
father's back was turned, Aladdin was gone for that day

Plate 46.—Record of Subject A30 reading silently without analysis

noted that the disturbance appears most clearly in the immediate neighborhood of verbs.

As in the case of Subject A27, so in the case of Subject A29, the demand for a reproduction of the ideas was responded to with less effort than either the demand to read silently and answer questions or the demand to read silently and report word for word.

Subject A31 evidently was a great deal disturbed by the demand for special attention to pronunciation and enunciation. This is seen if the record for the fourth passage is compared with the record for oral reading of the first passage. Sample lines of the records are given in Plates 37 and 38. Special attention should be paid, in examining these plates, to the time records of the various fixations.

Other subjects than those who have been reported thus far in this chapter were put through the series of tests. The photographs of their eye-movements were not sufficiently successful to yield full records. There were, however, usable portions of records and these confirm the findings which have been presented. A number of these partial records are worth reproducing.

Plates 39 and 40 show the contrast between simple reading and grammatical analysis for Subject A20, and Plates 41 and 42 bring out the same contrast for Subject A21. Comparing Subjects A20 and A21, it will be noted that Subject A21 is in general a more rapid reader than Subject A20.

Subjects A24 and A30 are reported in Plates 43 and 44 in respect to their efforts to locate peculiar words, and records of their silent reading under the conditions of the second test are added for comparison in Plates 45 and 46.

In preparation for the records described in the next chapter, fifteen subjects were required to paraphrase passages. The result in every case is similar to that described in detail for Subject A23. The reading breaks down to such an extent that the process can no longer be adequately described as a reading process.

The effects of asking various subjects to give particular emphasis to pronunciation are quite irregular. Some subjects do not seem to be seriously disturbed by this demand; others are much disturbed. A like disagreement appears in the case of records of silent reading for dictation of ideas and silent reading for verbatim repetition. These facts probably mean that the accidents of individual training are such that in some cases economical methods of one or the other of these operations have been fully mastered, while in other cases crude methods have been picked up and never refined to the point where the subject can perform the requirement in question without distraction.

Such a conclusion brings us back at the end of the discussion of records to the fundamental pedagogical applications of the whole study. So long as teachers fail to discriminate between different forms of reading and different forms of analytical study, pupils will adopt a purely accidental method. Fortunately, some are forced by circumstances to adopt intellectual methods which are highly advantageous. Others unfortunately, never acquire fluent habits. They are, from the nature of the case, uncritical of their own methods, since there has never come into their experiences any demand for improvement. They are utterly unguided because it has never occurred to teachers to train them for the different kinds of analytical tasks and forms of reading. Since here, as elsewhere in the world, the chances of going wrong are more numerous than the chances of going right, the great majority, even of mature and otherwise well-trained people, exhibit some lines along which they are peculiarly incompetent.

What is needed in the educational management of young people is, first of all, a clear understanding of the special demands of each type of reading and the special methods of each type of analysis. When teachers are clear on these matters, there will rapidly accumulate through school practice satisfactory methods of dealing with each situation.

CHAPTER V

READING FOREIGN LANGUAGES

So much of the time of the high school is devoted to instruction in foreign languages that no study of reading of the more complex types is complete which does not raise such questions as the following: What do high-school pupils do when they learn foreign languages? Do they read or do they exhibit some form of analytical study that cannot be described as reading?

In any attempt to answer such questions as these, one must, of course, be prepared to define very clearly the exact purpose and scope of the discussion. There are so many vested interests and bitter partisan prejudices in this field that while the scientist may roam at will among the problems of vernacular reading and excite no animosities, he must step with caution when he approaches the citadel of foreign-language instruction in the high school.

This chapter reports records of what students from seven high schools did when confronted with (*a*) passages in English; (*b*) mixed passages containing in some instances French words and phrases, in other instances Latin words and phrases; and (*c*) pure French or Latin passages.

Students were chosen from seven high schools for the reason that results secured from a single school would not be accepted as typical. The seven schools in or near Chicago from which students were taken are as follows: the Hyde Park High School, the Englewood High School, the Joliet Township High School, the Evanston Township High School, the Oak Park Township High School, the Deerfield-Shields Township High School, and the University High School of the University of Chicago. These schools, needless to say, fulfil all of the conditions of high-grade instruction in French and Latin. Their students are admitted each year to the most exacting colleges in the country.

Each school was asked to co-operate in the investigation by sending, in November and December, 1921, two of the best students in third-year French and two of the best students in third-year Latin. The schools responded generously to the invitation, and in each case the young people came with their teachers and took the tests.

The third year was chosen for obvious reasons. In the first place, the pursuit of the language for two years and one term guaranteed such training as the departments would surely recognize as carrying the student beyond the rudiments. In the second place, the investigations of President Brown[1] make it perfectly clear that Latin comes to a crucial period in the third year.

The best students were selected because it was not intended in this study to make an exhaustive investigation of all of the immature stages through which the languages pass. It was the purpose of this investigation merely to deal with the foreign languages as examples of reading for the purpose of throwing light on the general psychological and educational character of the reading process.

Students in two languages were taken because it was thought that it would be well to compare foreign languages with each other, as well as with English. Only two foreign languages were included in the inquiry because there is at the present time no third which can properly be compared with French and Latin.

Again, in defining the scope of the present investigation, let it be said explicitly that this is an inquiry into reading. It is not an inquiry into the best methods of teaching French and Latin. It is not an inquiry into the relative ease or difficulty of either of the languages. It deals with these languages as specimens of pedagogical material. It is assumed that the languages are taught in the schools with a view to teaching students to read them. If there is anyone who thinks that French or Latin ought not to be read in the high school, he should stop reading this chapter at this point. If there is anyone who thinks that Latin or French should be investigated for a thousand other virtues besides training students in reading, he must regard his belief as outside of the scope of this monograph. We are not making an inquiry into virtues; we are dealing purely and simply with the mode of reading French and Latin exhibited by high-grade high-school pupils.

In order to economize the time of those who are not interested in details, it may be stated that the results show that in no case does a third-year student of the best grade in seven high schools in and around Chicago read Latin. By contrast, most of the pupils who have had a corresponding amount of French show characteristic symptoms of reading, although their reading is of a labored type.

The Latin students are interesting for what they do as well as for what they do not do. They do something that corresponds fairly closely to what was found in the paraphrasing tests described in the last chapter.

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[1] H. A. Brown, *Latin in Secondary Schools*. Oshkosh, Wisconsin: State Normal School, 1919. Pp. x+170.

They dwell on words, and they fixate points in a passage with repeated forward and backward movements. The chief difference between what these students do in Latin and what they do in paraphrasing is that they exhibit in Latin somewhat greater confusion than in paraphrasing.

With this introduction we turn to an exhibition of details.

In order to establish a background for the study of high-school French and Latin, records were secured of the reading of these languages by mature students. Such students were easily accessible through the departments of the University of Chicago. For Latin two graduate students were photographed. For French a number of undergraduates were photographed.

Plates 47 to 51 give four lines each from the records of five students of varying degrees of proficiency in French. The reading in each case was tested for comprehension by asking the reader to write out what he had read. The results of this part of the test were entirely satisfactory.

Plates 52 and 53 give four lines each from the records of two graduate students in Latin. These also show different degrees of mastery of Latin. For purposes of comparison records were taken from these subjects of their ability to read English narrative prose. The results are shown in Plates 54 and 55.

Though outside of the immediate scope of this study, a German record may be brought in, together with an English record from the same subject. These are shown in Plates 56 and 57.

These mature foreign-language records show that a foreign language can be read in a manner directly comparable to the reading of the vernacular. To be sure, there are more pauses in a line of the German, Latin, and French than in a line of English, but the manner of reading is fundamentally the same. There is a forward movement of the eyes which shows that the reader is moving steadily toward the goal of an intelligent comprehension of what he is passing over.

Another totally different type of comparative material was collected before the Latin and French records were taken. This material constituted the subject-matter of the preceding chapter. All of the subjects who read either French or Latin read some English before reading the foreign language. Some of the students read several different kinds of passages, as reported. The clear indications of analytical mental processes which were presented in the study of these earlier records will guide our interpretation of the cases, to the study of which we now turn.

The passages used in the foreign-language reading were prepared in a series of ascending degrees of difficulty. The easiest passage was made

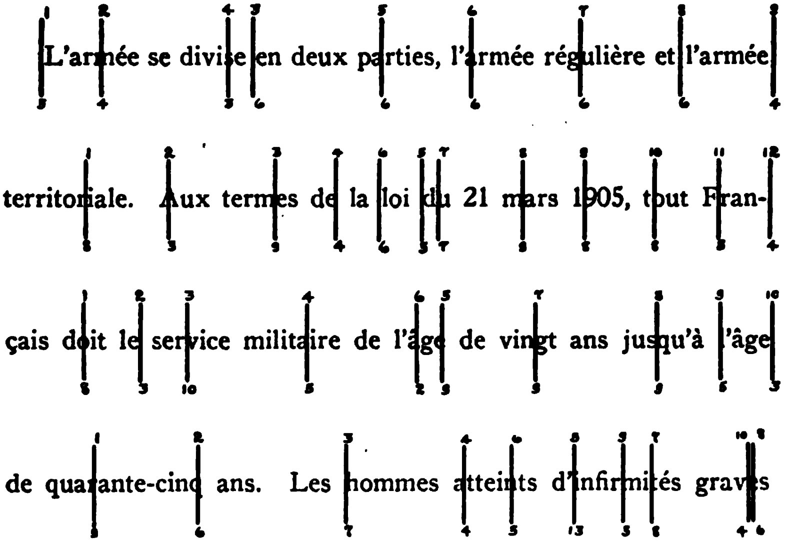

L'armée se divise en deux parties, l'armée régulière et l'armée
territoriale. Aux termes de la loi du 21 mars 1905, tout Fran-
çais doit le service militaire de l'âge de vingt ans jusqu'à l'âge
de quarante-cinq ans. Les hommes atteints d'infirmités graves

PLATE 47.—Record of Subject H.E. reading silently a French passage

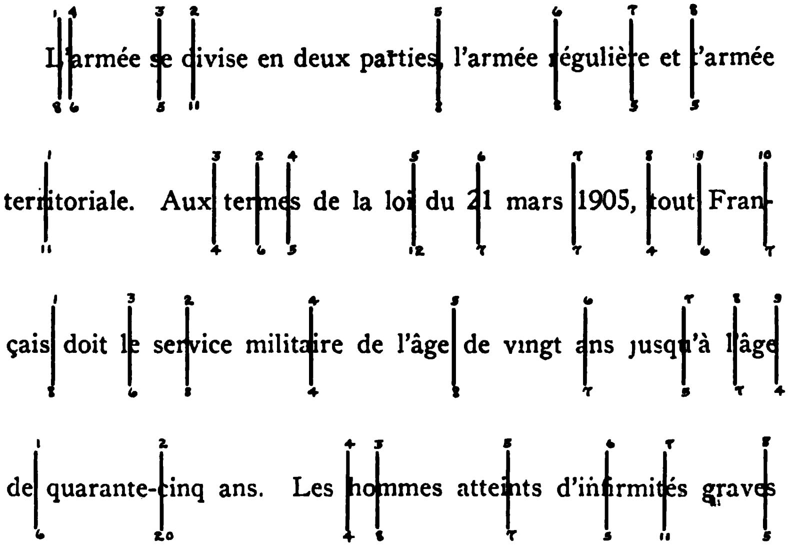
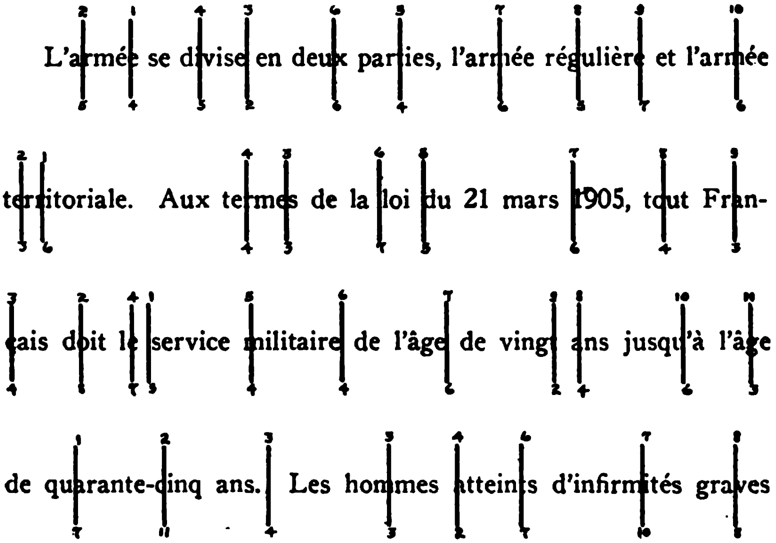

L'armée se divise en deux parties, l'armée régulière et l'armée
territoriale. Aux termes de la loi du 21 mars 1905, tout Fran-
çais doit le service militaire de l'âge de vingt ans jusqu'à l'âge
de quarante-cinq ans. Les hommes atteints d'infirmités graves

PLATE 48.—Record of Subject J.F. reading silently a French passage



L'armée se divise en deux parties, l'armée régulière et l'armée territoriale. Aux termes de la loi du 21 mars 1905, tout Français doit le service militaire de l'âge de vingt ans jusqu'à l'âge de quarante-cinq ans. Les hommes atteints d'infirmités graves

Plate 49.—Record of Subject N.F. reading silently a French passage

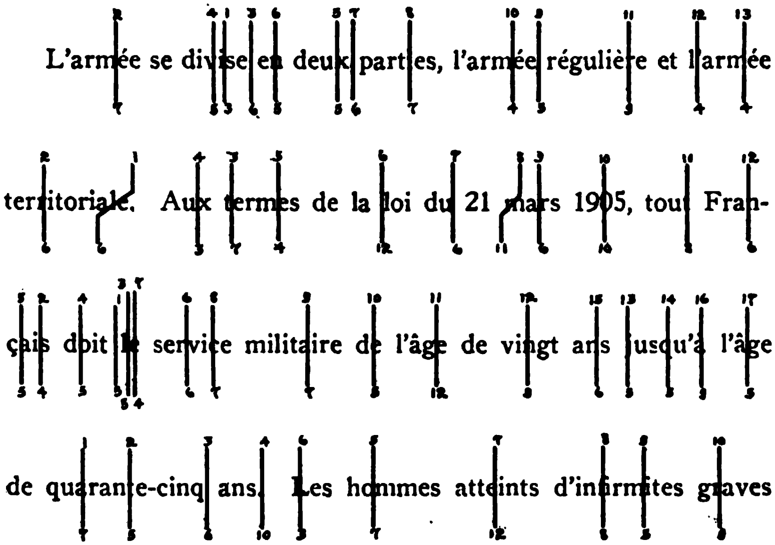
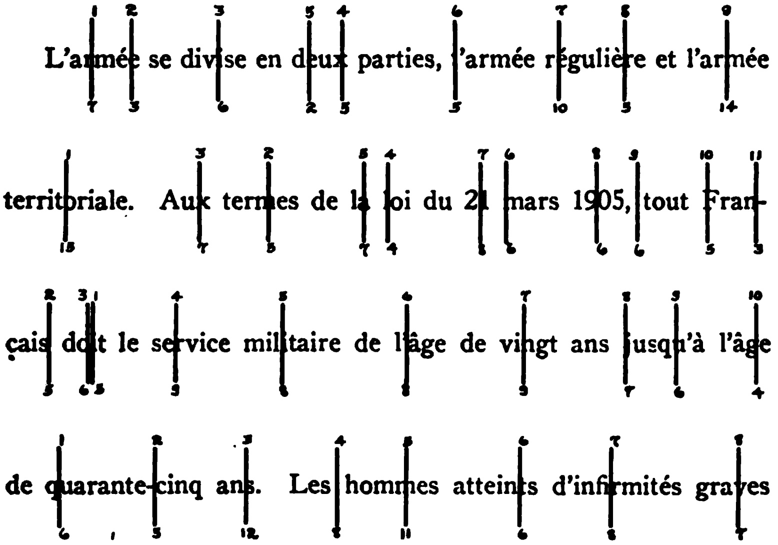
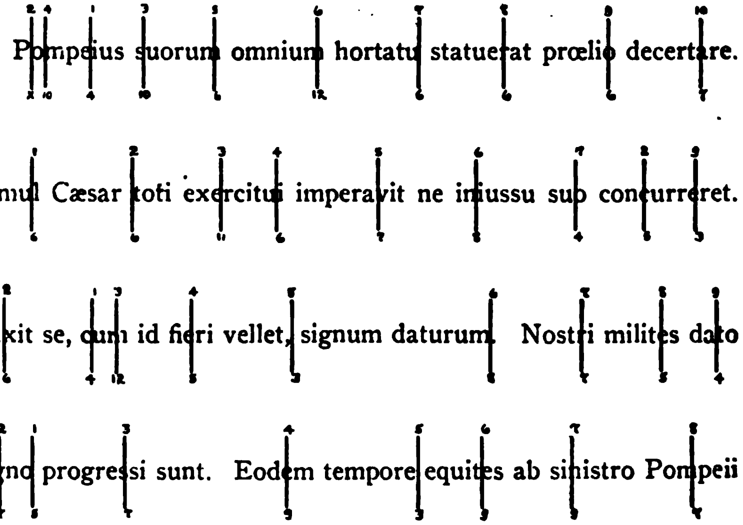

L'armée se divise en deux parties, l'armée régulière et l'armée
territoriale. Aux termes de la loi du 21 mars 1905, tout Fran-
çais doit le service militaire de l'âge de vingt ans jusqu'à l'âge
de quarante-cinq ans. Les hommes atteints d'infirmites graves

Plate 50.—Record of Subject B.F. reading silently a French passage



L'armée se divise en deux parties, l'armée régulière et l'armée territoriale. Aux termes de la loi du 21 mars 1905, tout Français doit le service militaire de l'âge de vingt ans jusqu'à l'âge de quarante-cinq ans. Les hommes atteints d'infirmités graves

Plate 51.—Record of Subject S.D. reading silently a French passage



Pompeius suorum omnium hortatu statuerat prœlio decertare.
Simul Cæsar toti exercitui imperavit ne iniussu suo concurreret.
Dixit se, cum id fieri vellet, signum daturum. Nostri milites dato
signo progressi sunt. Eodem tempore equites ab sinistro Pompeii

PLATE 52.—Record of Subject B.B. reading silently a Latin passage

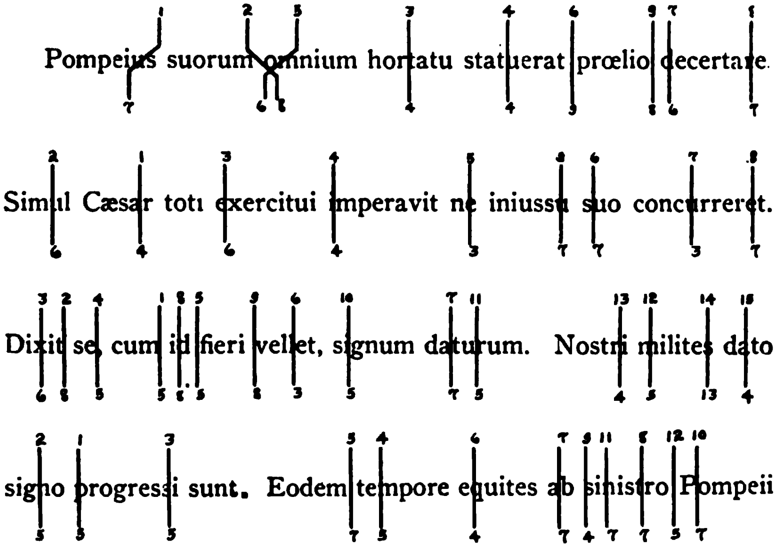
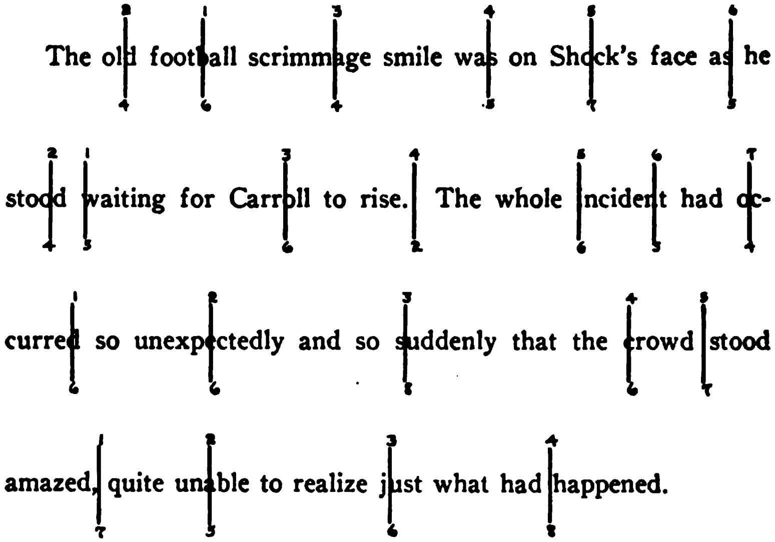
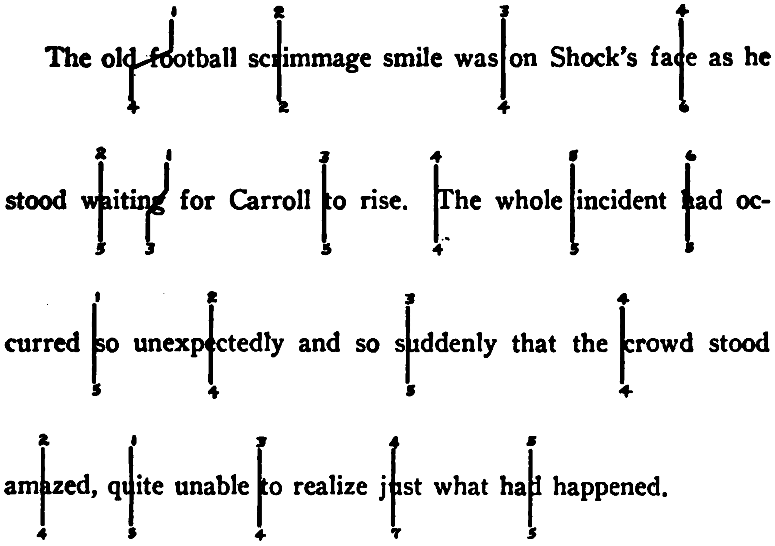

Pompeius suorum omnium hortatu statuerat prœlio decertare.
Simul Cæsar toti exercitui imperavit ne iniussu suo concurrerent.
Dixit se, cum id fieri vellet, signum daturum. Nostri milites dato
signo progressi sunt. Eodem tempore equites ab sinistro Pompeii

PLATE 53.—Record of Subject F.H. reading silently a Latin passage



The old football scrimmage smile was on Shock's face as he stood waiting for Carroll to rise. The whole incident had occurred so unexpectedly and so suddenly that the crowd stood amazed, quite unable to realize just what had happened.

PLATE 54.—Record of Subject B.B. reading silently an English passage



The old football scrimmage smile was on Shock's face as he stood waiting for Carroll to rise. The whole incident had occurred so unexpectedly and so suddenly that the crowd stood amazed, quite unable to realize just what had happened.

PLATE 55.—Record of Subject F.H. reading silently an English passage

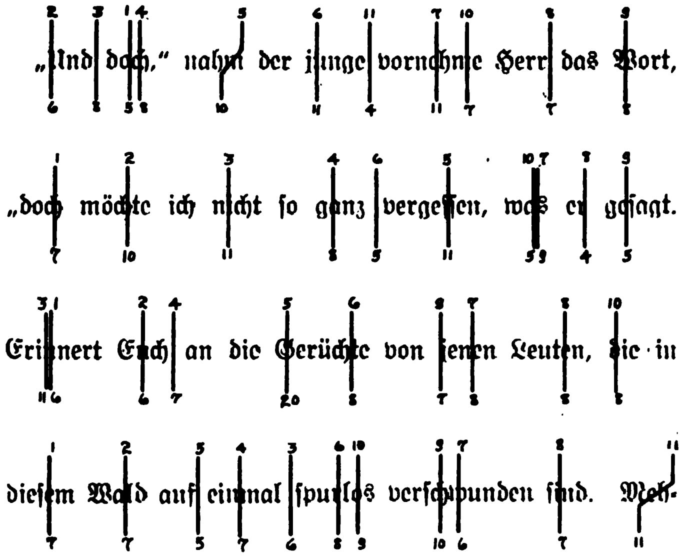

„Und doch," nahm der junge vornehme Herr das Wort,
„doch möchte ich nicht ſo ganz vergeſſen, was er geſagt.
Erinnert Euch an die Gerüchte von jenen Leuten, die in
dieſem Wald auf einmal ſpurlos verſchwunden ſind. Meh-

PLATE 56.—Record of Subject F.D. reading silently a German passage

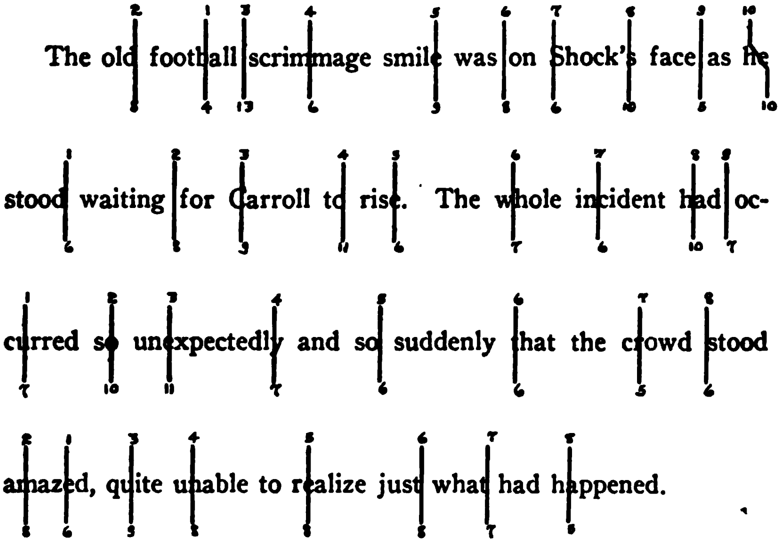

The old football scrimmage smile was on Shock's face as he stood waiting for Carroll to rise. The whole incident had occurred so unexpectedly and so suddenly that the crowd stood amazed, quite unable to realize just what had happened.

Plate 57.—Record of Subject F.D. reading silently an English passage

up of a mixture of English and the foreign language. Enough of the meaning of the passage could be secured by the student from the English so that, even if he could not translate the foreign phrases, he would get through most, if not all, of the passage. In the next more difficult passage the foreign words and phrases preponderated. In the third and fourth passages only foreign words appeared. The two passages which were made up entirely of French were of about the same degree of difficulty. In the case of the passages made up wholly of Latin, the first was taken from the early part of a second-year Latin reader, and the second was taken from one of the books of Caesar which the pupils were not likely to have read.

The French passages are reproduced in full, as follows:

> The vengeance **des hommes,** as Dantès had already said to himself, had plunged him into the abyss **où il se trouvait.** He **était** innocent of the political crime **dont on l'accusait,** the crime of having conspired **pour le retour de Napoléon Ier.** In 1815, Dantès **avait été** a sailor in the merchant marine. **Pendant une traversée** the captain of this boat **tomba malade** and feeling that he was going to **mourir** he asked Dantès to turn toward the island of Elbe and **de remettre une lettre** to Marshall Bertrand, the confidant of Napoléon.
>
> **Les prières d'un supérieur sont des ordres.** After the death of the captain Dantès **obéit à ses ordres, sans rien savoir du contenu de la lettre. Mais** Danglars, the only enemy of Dantès **à bord du navire avait entendu** the conversation **entre le capitaine et lui** and he had surmised **tout de suite une conspiration bonapartiste.** Upon his return from the island of Elbe, Danglars **vit qu'il tenait à la main une autre lettre.**
>
> Le 25 février on arriva à Marseille. Dantès courut voir son vieux père avant de repartir pour porter en personne à Paris la réponse de l'île d'Elbe. Mais le lendemain il fut arrêté. Danglars l'avait dénoncé à la police. "On aura la preuve de son crime en l'arretant" dit-il, "car on trouvera une lettre pour le comité bonapartiste de Paris ou sur lui ou chez son père, ou dans sa cabine à bord du navire." Traîné devant le juge, Dantès fournit des preuves de son innocence.

Il allait être mis en liberté lorsque le juge découvrit que la réponse de l'ile Elbe était adressée à un M. Noirtier. —Or ce Noirtier était le père de juge, père qui, à cause de ses opinions politiques, avait toujours été un obstacle au bonheur de son fils. Sans plus hésiter, le juge envoya Dantès au château d'If, sombre prison sur une île près de Marseille, prison destinée aux grands coupables politiques.

The Latin passages are as follows:

There were at one time **duo** very celebrated artists, **alter** of whom was called Zeuxis, **alter** Parrhasius. Zeuxis had painted a **puerum** carrying grapes, and so **bene** had he imitated **naturam** that the birds flew to his painting and **conarentur** to eat the grapes. Then Parrhasius **attulit** his painting, in **qua** he had painted a curtain. Parrhasius, however, **videbatur** to delay, and Zeuxis being deceived **inquit**: "Draw aside the curtain that I may see the **tabulam**." But **statim** he perceived his **errorem**, and gave Parrhasius the **praemium** with these **verbis**: "**Ego** deceived only the birds, **tu** have deceived me."

After this **proelium** the **Athenienses** gave **eidem** Miltiades **classem** of seventy **navium** that he might proceed against the **insulas** which had assisted the **barbaros**. With this **imperio** Miltiades **coegit** a considerable number to **redire** to their **officium** but **nonnullas** he captured **vi**. **Cum** he could not **oratione conciliare** the **insulam** Paros, which was **elatam opibus**, **eduxit** his **copias** from **navibus**, **clausit** the city **operibus**, and **privavit** it of all **commeatu**. **Tum**, having erected **vineis ac testudinibus**, **accessit** nearer the **muros**.

Numa Pompilius rex Romae creatus est, qui bellum quidem nullum gessit, sed civitati tamen magnopere profuit. Nam et leges Romanis moresque constituit, et annum in decem menses descripsit, et sacra Romae ac templa constituit. Huic successit Tullus Hostilius, qui bella reparavit, Albanos vicit, Veientes et Fidenates bello superavit, et urbem maiorem fecit. Deinde regnum Tarquinius accepit.

> Mittit primum Brutum adulescentem cum cohortibus Caesar, post cum aliis C. Fabium legatum; postremo ipse cum vehementius pugnaretur, integros subsidio adducit. Restituto proelio ac repulsis hostibus, eo quo Labienum miserat contendit; cohortes quattuor ex proximo castello deducit, equitum partem se sequi, partem circumire exteriores munitiones, et a tergo impetum in hostes facere iubet.

The procedure in using these passages was as follows: The student was given the first passage from the story of Aladdin in English and was asked to read it out loud. No special directions were given. At the end of the reading two questions were asked. Second, the student was asked to read to himself the second Aladdin passage, and two questions were asked. At this point, in the case of some of the students, the long series of tests described in the preceding chapter was carried out; in other cases the foreign-language series was begun at once.

The foreign-language passages were taken up as follows: The student was told that a passage would be shown telling a story in English and that he would find scattered through this passage a few foreign words and phrases. He was told to read the passage to himself and then to go back to the beginning and read the passage aloud, translating into English each of the foreign words.

After he had done as directed a second passage was shown him, with the preliminary statement that it would have more foreign words than the first. He was asked, as before, to read it silently and then to translate.

The third passage, made up of foreign words throughout, was described, and the student was told to read it silently and then to translate.

The procedure with the fourth passage varied slightly in that the student was asked to pronounce the text in French or Latin before he read it silently. After that he was to proceed as in the other cases.

This procedure gave the student in every case the advantage of a silent reading before he had to translate. It also gave the experimenter a check on the student's understanding of the passage. The translation was in every case dictated into a phonograph.

Since the French records are distinctly superior to the Latin records, we may make an analysis of one of the French records as introductory to the general study. The subject whose record is to be used for this purpose was selected on several grounds. In the first place, her records are among those used in the last chapter; we know, therefore, a great deal in detail about her reading habits. Second, her records in French are near the median of the general table which will be presented later. Third, her photographic records are exceptionally clear so that there were very few points in which the record could not be accurately and readily interpreted. The case cannot be regarded as average or typical in any definite mathematical sense, but it is a fair sample of French reading as exhibited by the schools examined.

Subject A23 is a high-school Junior. She has been taught French by a combination method which gives a great deal of direct practice in oral French and at the same time lays emphasis on grammatical analysis in each recitation. Her instruction, as contrasted with the Latin teaching which will be studied later, was more largely by the "direct" method; as contrasted with some of the French teaching, it was more grammatical.

We may properly begin with her reading of ordinary English prose. Plate 58 gives a part of her record for silent reading under the conditions described in the preceding chapter for the second passage. Her paraphrasing, which may be thought of as the extreme example of analytical study, was more labored than average, involving 48.0 fixations per line, with an average duration of 9.0 twenty-fifths of a second.

Plates 59 and 60 show respectively the first four lines of silent reading and oral translation of the first passage in which French appears. It is very obvious that this subject does not read French as she reads English. The French records show that when she comes to a foreign word or phrase there is very frequently a slowing up, which proves that the French requires more effort than does ordinary English.

Certain interesting contrasts appear also between the silent and oral French records. The end of the fourth line is read silently without any indication of increased effort. When, however, it comes to translating this line, we find the subject showing the typical symptoms of effort. The record for oral translation is distinctly analytical in character.

Two hypotheses can be formulated to explain the facts here observed. Either the reader got the idea easily from a direct inspection of the French and was confused later by the demand that she find English equivalents for the French words, or else she slighted the passage in the first instance and missed the full meaning but had no such escape when it came to the translation.

There can be no doubt that there are cases which show the same symptoms as this which are explained by the first type of hypothesis. For example, the long processes of paraphrasing described in Chapter IV are of this type. On the other hand, there are certainly cases where the

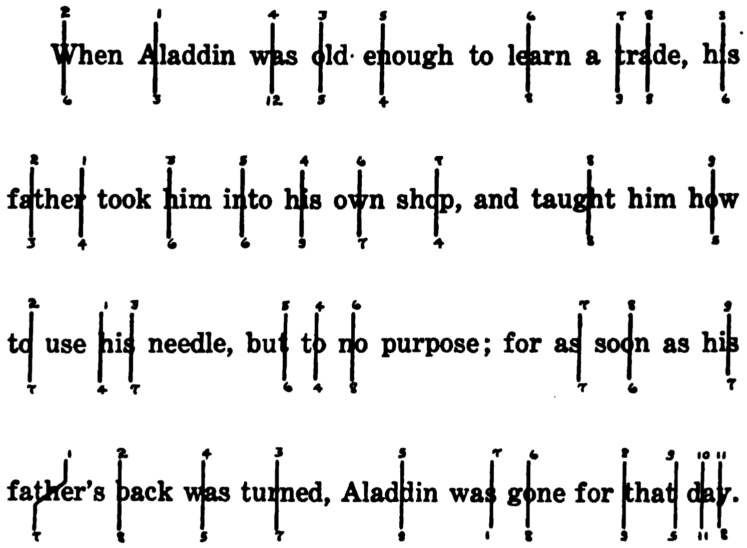

When Aladdin was old enough to learn a trade, his
father took him into his own shop, and taught him how
to use his needle, but to no purpose; for as soon as his
father's back was turned, Aladdin was gone for that day.

PLATE 58.—Record of Subject A23 reading silently an English passage

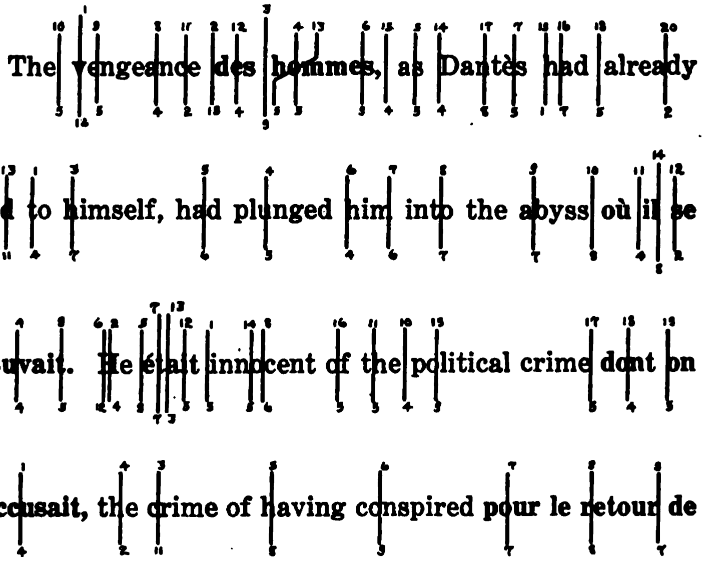

The vengeance des hommes, as Dantès had already
said to himself, had plunged him into the abyss où il se
trouvait. He était innocent of the political crime dont on
l'accusait, the crime of having conspired pour le retour de

Plate 59.—Record of Subject A23 reading silently the simplest mixed English and French passage.

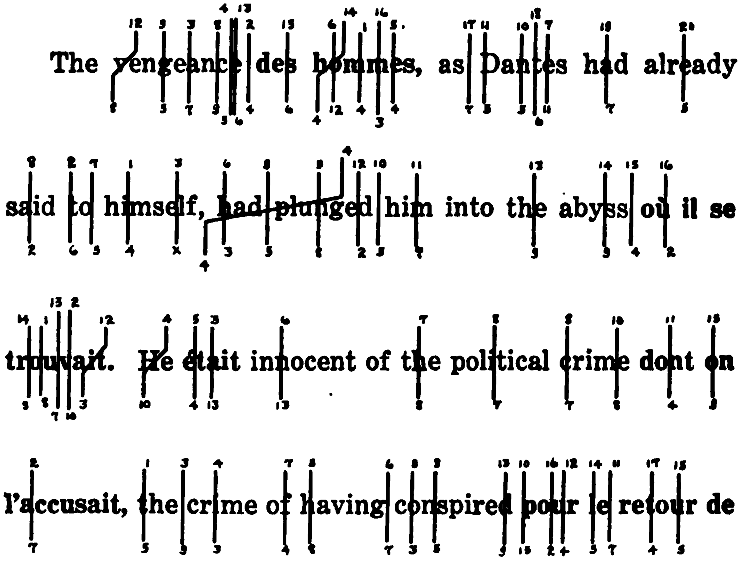

The vengeance des hommes, as Dantes had already
said to himself, ~~had plunged~~ him into the abyss où il se
trouvait. He était innocent of the political crime dont on
l'accusait, the crime of having conspired pour le retour de

PLATE 60.—Record of Subject A23 reading aloud and translating the simplest mixed English and French passage.

reader skims through a passage and simply drops out of his thinking any feeling of responsibility.

In this particular case, the probable explanation is the first, because the student knew that in a moment she would have to translate and, furthermore, she succeeded in translating the passage very well.

A very striking example of what is meant by the analysis of a line can be seen if we plot, by the more elaborate method, the second and third lines of the silent record. Plates 61 and 62 show these two lines. Plate 61 shows the typical straightforward movement of the eye in reading a passage that is fully comprehended without very much analysis. To be sure, even in this plate, there is some regression, as in fixations 2, 5, and 13, but the regressions are isolated, individual movements. The third line, as shown in Plate 62, is, on the contrary, full of genuine efforts at analysis, involving, not isolated regressions, but series of efforts to master difficulties that require more than a single glance backward.

A question always arises when analysis is shown by a series of eye-movements as to the degree of backward and forward movement that may be thought of as justifying the statement that the subject is not reading the passage. It is, for example, evident from these French records that the subject is forced to make more of an analysis than is necessary in the reading of English prose, but one would hesitate to render the verdict, even in these two lines, that the subject is not reading. Definition comes to be a matter of degree. If analysis goes too far, then the reading must be thought of as superseded or interrupted by something that is not reading. Without attempting to answer the question as to the degree of analysis which marks the boundary of reading, we may go on with the study of records, mindful, however, of the necessity of deciding sooner or later when the line is crossed.

Subject A23's reading of the second mixed passage is exhibited in Plates 63 and 64. Perhaps the most striking new phenomenon in this case is the way in which the preparation secured in the silent reading of the third line carried over into the oral translation of this line.

The performance of this subject throughout is such as to prove that she is master of the situation, though only with effort.

The sixth line of this passage gave Subject A23 serious difficulty when she tried to translate it. The silent reading was done with no clear symptom of confusion. One regression at the end of the line may have been due to some slight recognition of difficulty. But the translation brought out the difficulty in a striking way. The translation showed also that the subject was not clear as to the meaning of the adjective in

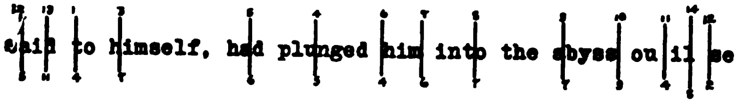


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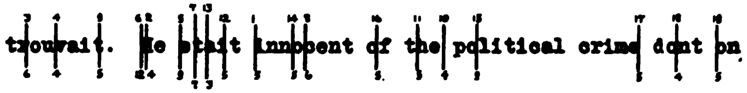
Plate 61.—Rearrangement of the record of the second line shown in Plate 59



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                    innocent

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                                                  e dont on
                                                     ont on
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PLATE 62.—Rearrangement of the record of the third line shown in Plate 59

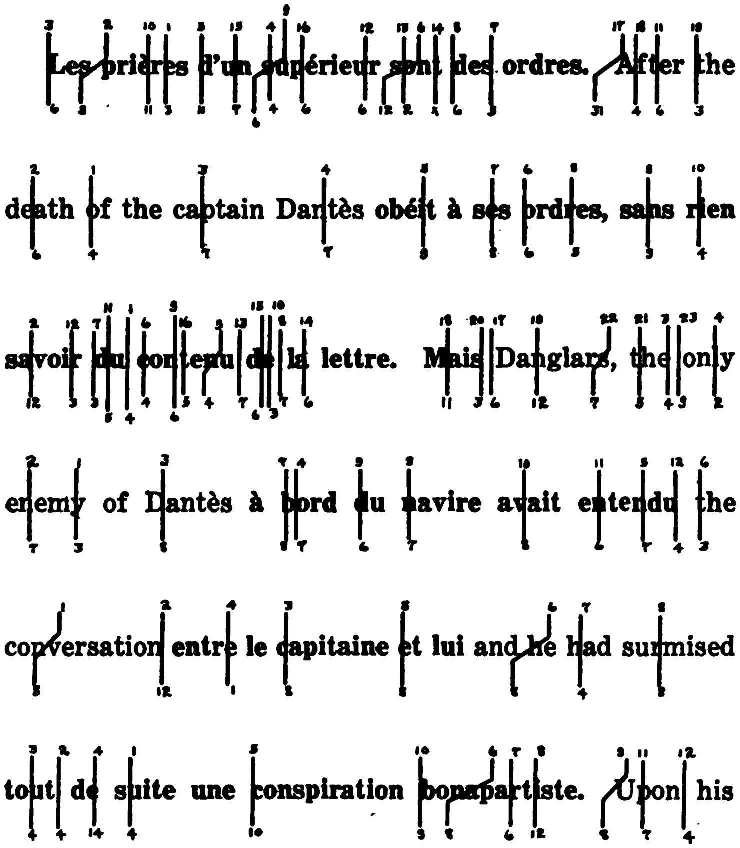


PLATE 63.—Record of Subject A23 reading silently the more complex mixed English and French passage.

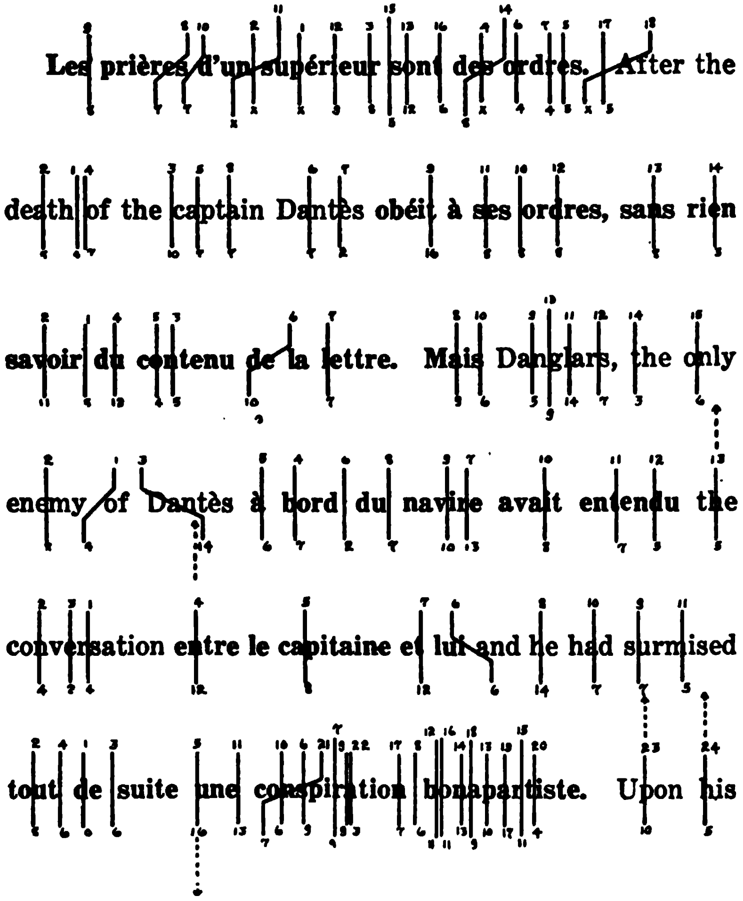

Les prières d'un supérieur sont des ordres. After the
death of the captain Dantès obéit à ses ordres, sans rien
savoir du contenu de la lettre. Mais Danglars, the only
enemy of Dantès à bord du navire avait entendu the
conversation entre le capitaine et lui and he had surmised
tout de suite une conspiration bonapartiste. Upon his

Plate 64.—Record of Subject A23 reading orally and translating the more complex mixed English and French passage.

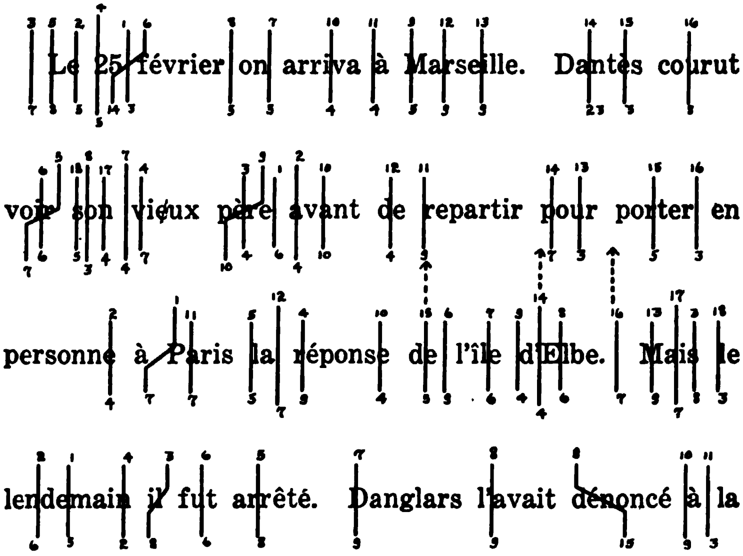

Le 25 février on arriva à Marseille. Dantès courut
voir son vieux père avant de repartir pour porter en
personne à Paris la réponse de l'île d'Elbe. Mais le
lendemain il fut arrêté. Danglars l'avait dénoncé à la

PLATE 65.—Record of Subject A23 reading silently a French passage

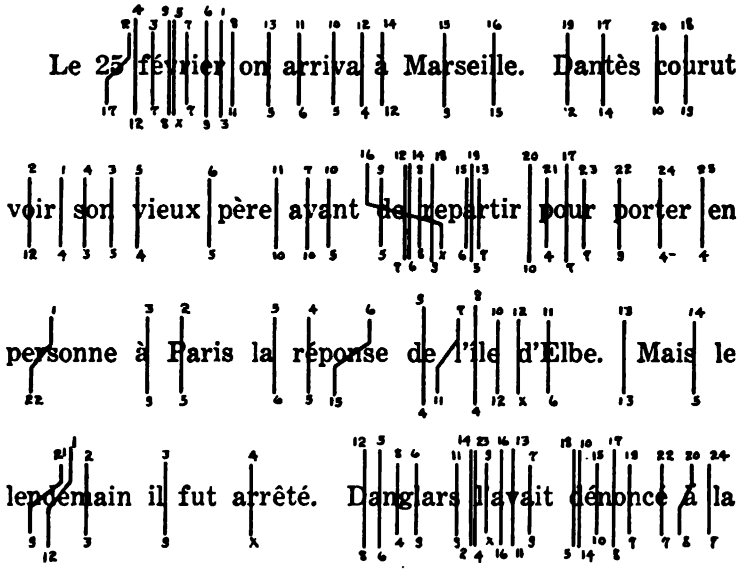

Le 25 février on arriva à Marseille. Dantès courut
voir son vieux père avant de repartir pour porter en
personne à Paris la réponse de l'île d'Elbe. Mais le
lendemain il fut arrêté. Danglars l'avait dénoncé à la

PLATE 66.—Record of Subject A23 translating orally a French passage

this case. The silent reading was probably felt to be satisfactory, because the main idea embodied in the noun was grasped and the adjective was recognized as of minor importance.

Plates 65 and 66 show the records of Subject A23 in coping with the first passage which is wholly French. Symptoms of extreme effort are by no means wanting. There are here and there very long fixation pauses. There are a great many fixations per line. There is regression and even analysis. Still the subject is getting through. She is doing the task that is here set for her more readily than she paraphrased an English passage. The reason for this is doubtless to be found in the mode of school training. Paraphrasing is seldom taught, and the student confronted by a vernacular phrase or word is not accustomed to finding in his mind the synonym which will permit paraphrasing. On the other hand, school training has constantly been giving practice in the finding of translations for French words, and so the subject translates better than she paraphrases.

TABLE XVII

RECORD OF SUBJECT A23 FOR THE READING OF MIXED PASSAGES AND FRENCH PASSAGES

Kind of Reading	Average Number of Fixations per Line	Average Duration of Fixation Pauses
First mixed:		
Silent reading	12.7	6.3
Oral translation	13.4	7.8
Second mixed:		
Silent reading	13.1	6.4
Oral translation	15.8	7.7
First French:		
Silent reading	14.1	6.1
Oral translation	20.6	7.7
Second French:		
Pronunciation	19.4	7.5
Silent reading	12.4	6.5
Oral translation	22.2	7.4

The second French passage was first pronounced in French. The record, Plate 67, gives us an opportunity to study a type of analysis not dealt with in earlier examples. The only demand here made on the subject is that she pronounce one French phrase after another. Any analysis which she makes in this case will not be for the purpose of getting meaning out of the passage but merely for the sake of guiding pronunciation. The successive fixations are, therefore, comparatively straightforward. This appears in a very striking way if one contrasts Plates 67 and 68, the latter of which shows the record of silent reading. For

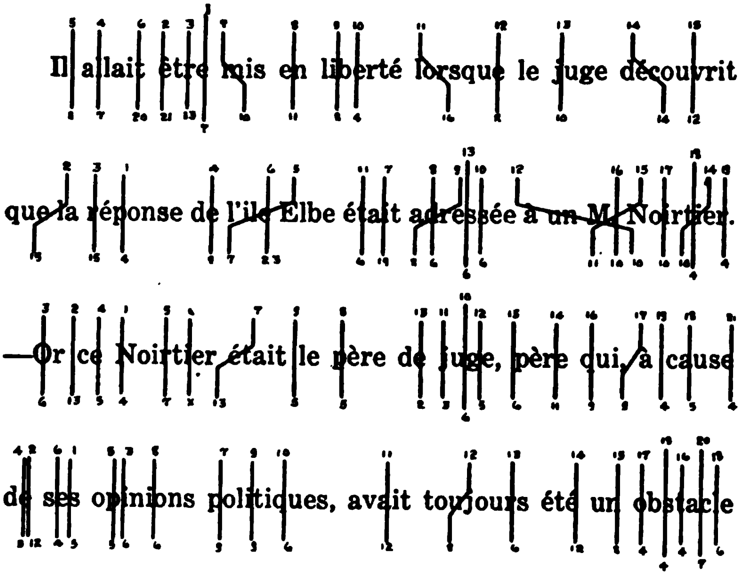

Il allait être mis en liberté lorsque le juge découvrit
que la réponse de l'île Elbe était adressée à un M. Noirtier.
—Or ce Noirtier était le père de juge, père qui, à cause
de ses opinions politiques, avait toujours été un obstacle

PLATE 67.—Record of Subject A23 pronouncing the words of a French passage

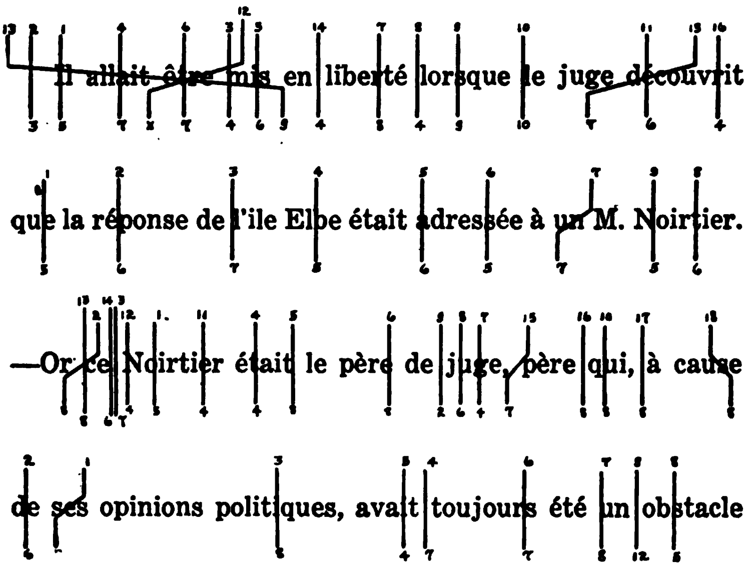

Il allait être mis en liberté lorsque le juge découvrit
que la réponse de l'ile Elbe était adressée à un M. Noirtier.
—Or ce Noirtier était le père de juge, père qui, à cause
de ses opinions politiques, avait toujours été un obstacle

PLATE 68.—Record of Subject A23 reading silently a French passage after having pronounced it.

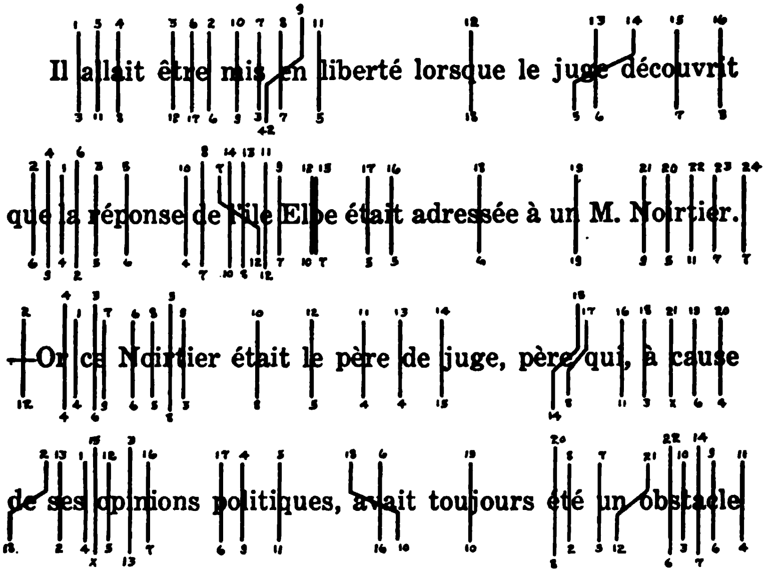
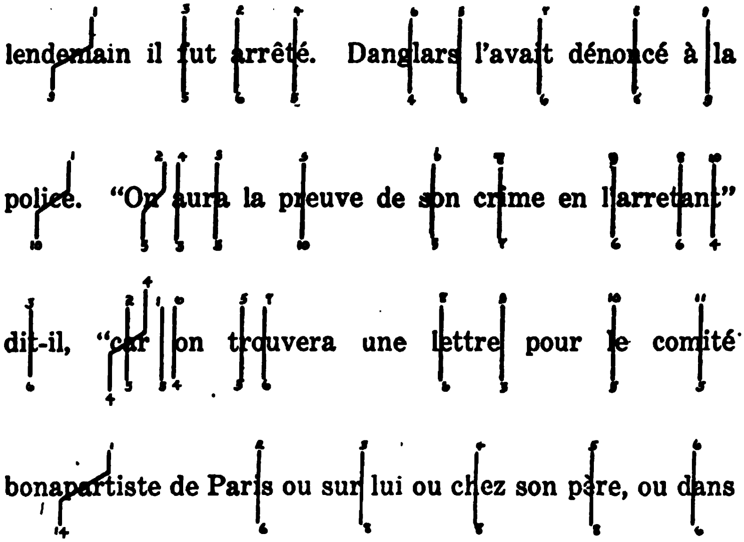

Il allait être mis en liberté lorsque le juge découvrit
que la réponse de l'île Elbe était adressée à un M. Noirtier.
Or ce Noirtier était le père de juge, père qui, à cause
de ses opinions politiques, avait toujours été un obstacle

PLATE 69.—Record of Subject A23 translating orally a French passage



lendemain il fut arrêté. Danglars l'avait dénoncé à la

police. "On aura la preuve de son crime en l'arretant"

dit-il, "car on trouvera une lettre pour le comité

bonapartiste de Paris ou sur lui ou chez son père, ou dans

PLATE 70.—Record of Subject A27 reading silently a French passage

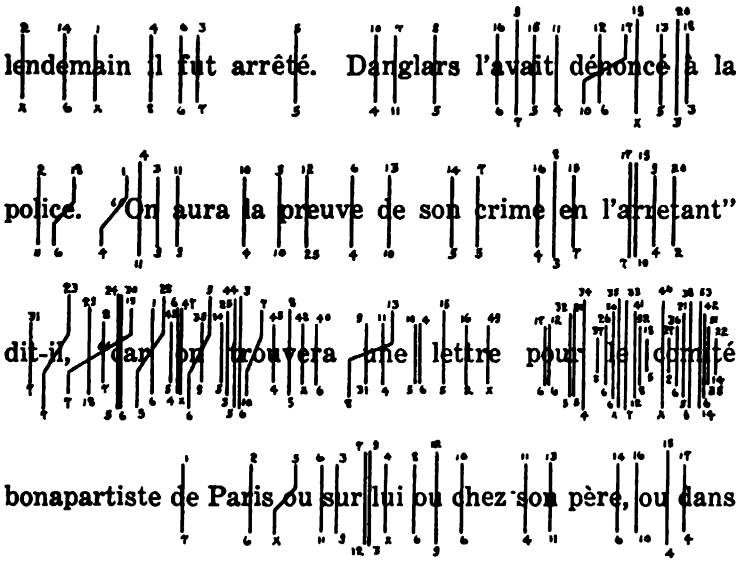

lendemain il fut arrêté. Danglars l'avait dénoncé à la
police. "On aura la preuve de son crime en l'arrêtant"
dit-il, "car on trouvera une lettre pour le comité
bonapartiste de Paris ou sur lui ou chez son père, ou dans

PLATE 71.—Record of Subject A27 translating orally a French passage

the sake of completeness Plate 69 gives the record of oral translation of the last French passage.

A statistical summary of the records made by Subject A23, including not only the lines shown in the plates but also all except the first and last lines of each passage which was read, is presented in Table XVII. The figures, when compared with those given in Table XII, show that the reading of French is more difficult for this subject than any of the tasks canvassed in the last chapter, except paraphrasing.

Subjects A27 and A28 read French and were also reported in the preceding chapter for various forms of analytical reading. Statistical summaries are given for the French records in Table XVIII. The reader's attention will immediately be attracted in this table by the large number of fixations and by the long average duration of the fixation pauses shown by Subject A27 in the oral translation of the first French passage. Examination of the records shows that the silent reading was done fluently, as though the subject were having no difficulty. Four lines are shown in Plate 70. When it came to the oral translation, difficulties piled up, as shown in Plate 71. Especially in the line beginning *dit-il* is there evidence that the subject lost entirely the thread of the narrative.

TABLE XVIII

RECORDS OF SUBJECTS A27 AND A28 FOR THE READING OF MIXED PASSAGES AND FRENCH PASSAGES

KIND OF READING	AVERAGE NUMBER OF FIXATIONS PER LINE		AVERAGE DURATION OF FIXATION PAUSES	
	Subject A27	Subject A28	Subject A27	Subject A28
First mixed:				
Silent reading	11.5	9.2	5.5	6.0
Oral translation	13.6	11.1	7.1	6.4
Second mixed:				
Silent reading	14.7	10.4	6.3	5.9
Oral translation	12.0	12.0	10.0	7.3
First French:				
Silent reading	11.7	9.7	6.8	6.2
Oral translation	21.0	13.2	8.1	7.1
Second French:				
Pronunciation	15.7	16.4	8.6	7.0
Silent reading	10.1	10.2	6.7	5.8
Oral translation	17.1	16.2	7.3	6.8

This line is one of the worst which appears in any of the French records. It is quite certain that even worse records could be secured if students of a lower rank of efficiency were tested. The object of this investigation was, however, as pointed out before, not to study the various stages of perfection of the ability to read French, but to find out how reading in this language compares with the reading of the vernacular. In the case reported in Plate 71 we have reached a point where, for a time at least, reading certainly breaks down completely. Here is a line which requires more effort than paraphrasing. Certainly we are safe in assuming that where translation is more difficult than paraphrasing the student is not mastering the situation. Nor can a student distracted by the difficulty of such a situation develop either literary appreciation of the passage or meaning from the sentence.

TABLE XIX

AVERAGE NUMBER OF FIXATIONS PER LINE OF NINE SUBJECTS FOR THE READING OF MIXED PASSAGES AND FRENCH PASSAGES

KIND OF READING	SUBJECTS								
	A2	A3	A8	A9	A13	A16	A20	A24	A34
First mixed:									
Silent reading	10.2	9.4	......	10.6	12.1	9.1	10.2	10.0	12.9
Oral translation	11.4	10.6	12.0	14.7	13.3	......	12.4	10.8	13.3
Second mixed:									
Silent reading	10.7	12.2	10.1	11.1	13.1	......	......	......	15.1
Oral translation	16.2	11.5	......	12.4	......	11.7	12.1	14.3	......
First French:									
Silent reading	12.2	......	9.6	......	14.4	11.1	9.9	......	13.6
Oral translation	......	12.3	......	13.4	22.1	16.6	13.1	14.1	19.7
Second French:									
Pronunciation	......	17.3	16.2	......	20.2	19.1	14.8	17.4	21.4
Silent reading	11.1	......	11.5	12.6	10.2	......	9.8	12.1	11.6
Oral translation	18.1	......	14.2	15.5	21.4	......	14.3	21.3	......

TABLE XX

AVERAGE DURATION OF FIXATION PAUSES OF NINE SUBJECTS FOR THE READING OF MIXED PASSAGES AND FRENCH PASSAGES

KIND OF READING	SUBJECTS								
	A2	A3	A8	A9	A13	A16	A20	A24	A34
First mixed:									
Silent reading	6.8	7.2	......	5.6	6.0	6.4	6.0	6.5	7.1
Oral translation	......	......	6.1	6.4	6.7	......	6.3	6.9	7.5
Second mixed:									
Silent reading	6.4	6.6	6.4	6.3	7.1	......	......	......	6.8
Oral translation	7.3	7.1	......	......	......	6.8	......	7.6	......
First French:									
Silent reading	6.8	......	6.0	......	6.5	6.1	6.0	......	6.6
Oral translation	......	6.7	......	6.9	7.1	7.9	7.1	7.2	......
Second French:									
Pronunciation	......	7.4	6.9	......	7.4	7.6	7.0	7.1	7.8
Silent reading	7.2	......	6.8	6.4	6.6	......	6.5	6.4	7.1
Oral translation	7.6	......	7.1	7.3	6.9	......	7.2	6.9	......

It remains to present the general results from the whole group of subjects tested in French and to point out the limits which these tests show in the ability of students in this field. Tables XIX and XX have been compiled for the purpose of presenting the general results. They are not complete because the records were not in all cases sufficiently clear to permit the experimenters to interpret them.

These tables show a degree of uniformity in the averages of students from various schools that is altogether astonishing. There are, of course, points in the tables which show marked departures from the general tendencies, but, taken all in all, the statistics show that the French students are behaving very much alike. Once more, it should, perhaps, be mentioned that these are the best third-year French students. They represent, therefore, the maximum which is to be expected of the best training in this field.

The translations given by these students were in the main satisfactory, so that it may be said that all of the evidence goes to show a mastery of French and ability to read French passages.

We turn now to a consideration of the records of fourteen Latin students. The results presented show in general a situation much more extreme than any found in the French records. Analytical types of reading are universal and of such an order as to make it evident throughout that these students have not learned to read Latin. The records of oral translation are in general not usable. The head-movements are so pronounced that they become the chief factors in the photographs of oral reading. Indeed, marked head-movements often occur in the records of silent reading, showing that the nervous tension is high.

Subject A29, whose records for English reading of various types are summarized in Table XV, page 72, Chapter IV, gave three usable Latin records. His oral records cannot be used for the reason referred to in the last paragraph. His record on the Caesar passage is quite unusable, in part because of excessive head-movements, in part because he gave up trying to read the passage.

The three usable records are presented in Plates 72, 73, and 74. A cursory glance at these plates shows the experimenter at once that he is not dealing with reading. Even in the simplest mixed passage, the Latin words create so great a distraction for the reader that they interrupt the continuity of the whole passage. When a line becomes at all difficult, as in the sixth line of this passage, the analytical movements overwhelm the reading movements completely. Plate 75 gives the details of the sixth line.

The situation grows steadily worse when we pass to the second mixed passage and finally to the story of the Roman kings. Plates 76 and 77 give the details of line 6 from the second mixed passage and of line 4 from the passage made up wholly of Latin.

Statistical treatment of these records is of doubtful value. There are such varieties in the length of fixation pauses and such complexity in the successive movements that there is little justification for combining such diverse elements into averages. For purposes of comparison, however, Table XXI presents records for three passages read silently.

Records were secured from Subject A35 which make it possible to compare silent reading with oral translation of Latin. Plates 78–82 give the records. Attention is called to the long duration of many of the fixation pauses as well as to the very large number of such pauses per line. Of special interest is the contrast in type of analysis shown when Plates 80 and 82 are compared. Details of line 3 for each of these records are exhibited in Plates 83 and 84.

TABLE XXI

RECORD OF SUBJECT A29 IN SILENT READING OF MIXED PASSAGES AND A LATIN PASSAGE

Silent Reading	Average Number of Fixations per Line	Average Duration of Fixation Pauses
First mixed	16.7	5.8
Second mixed	39.1	6.9
First Latin	45.4	7.2

There is no profit in attempting to canvass the whole series of records from the fourteen subjects who read Latin. They are alike in general character. We may, therefore, conclude our discussion by referring to two of the best. Plates 85 and 86 give portions of the records of Subject A10 for the Latin passage describing the Roman kings. The translation of the second Latin or Caesar passage by this subject is so imperfect that the record has value only as indicating what happens in an ineffectual attack. The records for pronunciation, silent reading, and oral translation of this passage are shown in Plates 87–89. Again, as in the case of Subject A35, the difference between the analysis in a pronunciation exercise and the analysis made during an attempt to understand is clearly illustrated. The complete surrender in translation is shown in lines 5 and 6 of Plate 89. A record of a Latin passage read silently by Subject A21 is given in Plate 90.

It would be interesting to know the conscious processes which are the counterpart of the record made during the attempt at silent reading.

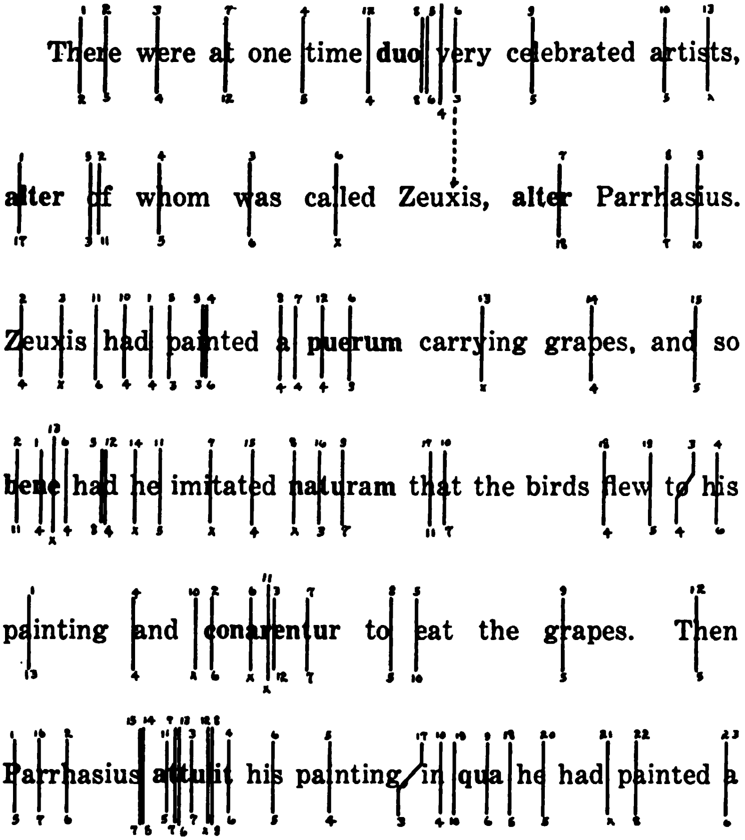

There were at one time duo very celebrated artists,
alter of whom was called Zeuxis, alter Parrhasius.
Zeuxis had painted a puerum carrying grapes, and so
bene had he imitated naturam that the birds flew to his
painting and conarentur to eat the grapes. Then
Parrhasius attulit his painting, in qua he had painted a

PLATE 72.—Record of Subject A29 reading silently a simple mixed English and Latin passage.

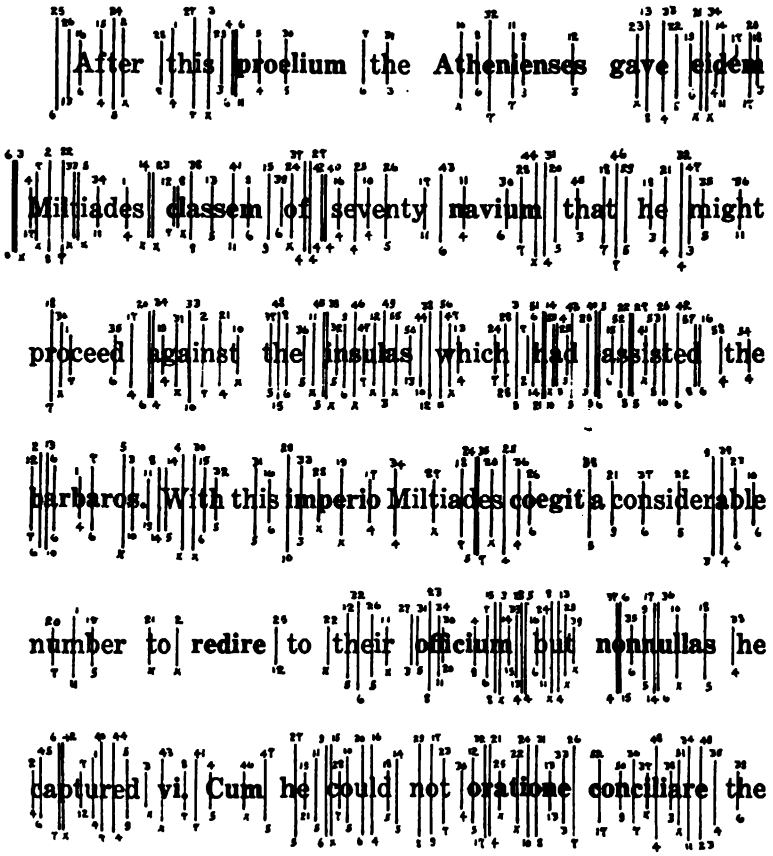
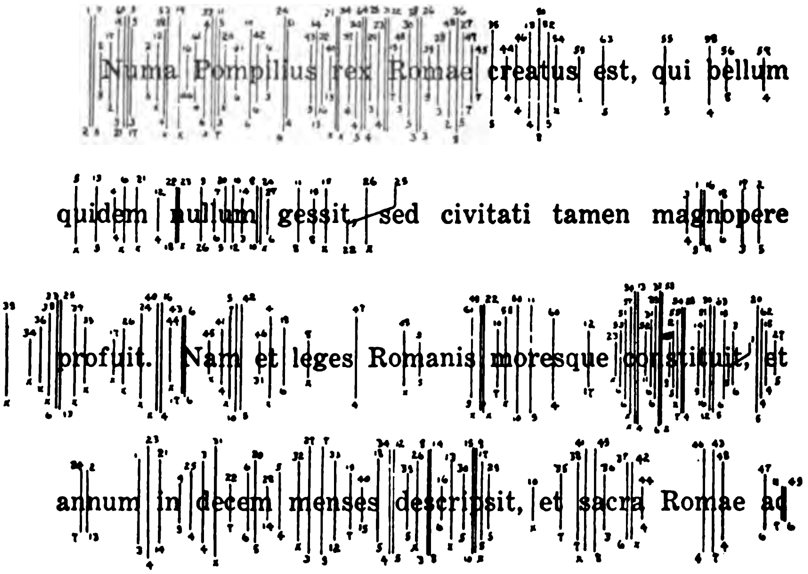
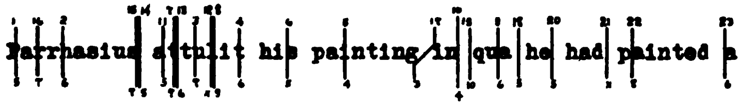

After this proelium the Athenienses gave eidem
Miltiades classem of seventy navium that he might
proceed against the insulas which had assisted the
barbaros. With this imperio Miltiades coegit a considerable
number to redire to their officium but nonnullas he
captured vi. Cum he could not oratione conciliare the

PLATE 73.—Record of Subject A29 reading silently a complex mixed English and Latin passage.



Numa Pompilius rex Romae creatus est, qui bellum
quidem nullum gessit, sed civitati tamen magnopere
profuit. Nam et leges Romanis moresque constituit, et
annum in decem menses descripsit, et sacra Romae ad

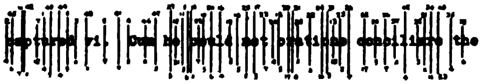
PLATE 74.—Record of Subject A29 reading silently a simple Latin passage



Parrhas
Parrhasius
attulit h
ulit his p
s painting
t his pain
s attulit
attulit hi
n qua he p
g in qua h
us attulit
attulit hi
s attulit h
sius attul
sius attul
Parrhasi
ting in qua
qua he ha

in qua he
a he had p
had paint
ad painted
ted a

PLATE 75.—Rearrangement of the record of the sixth line shown in Plate 72



captured v
captur
ured vi.
i. Cum he

tured vi.

captured

captured v
d vi. Cum
he could
he could n
n he could
not oratio

atione con
ould not o
he could
could not

ld not ora
ould not o

um he coul
could not
t oratione
oratione c
d not orat

ratione co
t oratione

ione conci
um he coul

he could n

ld not ora
not oratio

atione con

ot oration
tione conc

iliare the
iare the

conciliar
conciliare
ciliare th
re the

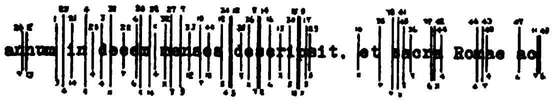
aptured vi
vi. Cum h
captured
red vi. C
ptured vi.
capture
Cum he c
Cum he co
nciliare t

liare the

e concilia
iliare the

ne concili

PLATE 76.—Rearrangement of the record of the sixth line shown in Plate 73



```
 nnum in de

annum in
      in decem

      in decem
          ecem mense
         decem mens

              m menses d
                     s descrips
                         scripsit,
                               it, et sac

                                                e ac

                  nses descr
                       descripsit

                     s descrips

                         scripsit,
                       descripsit
                          cripsit, e
                  nses descr

                menses des
         decem mens


  num in dec

        n decem me
 nnum in de

annum in
    m in decem
                       es descrip
          em menses

         ecem mense
                            cripsit, e
                          escripsit,
      in decem m
           cem mense
               menses de
                  nses descr

                                 , et sacra
                                    t sacra Ro
                                      sacra Roma

                                   et sacra
                     es descrip


                 enses desc
                                   et sacra
                                      sacra Roma

                                            Romae ac
                                      sacra Roma

                                   et sacra R
                                          a Romae ac

                                              mae ac
                                            Romae ac

                                                e ac
```

Plate 77.—Rearrangement of the record of the fourth line shown in Plate 74

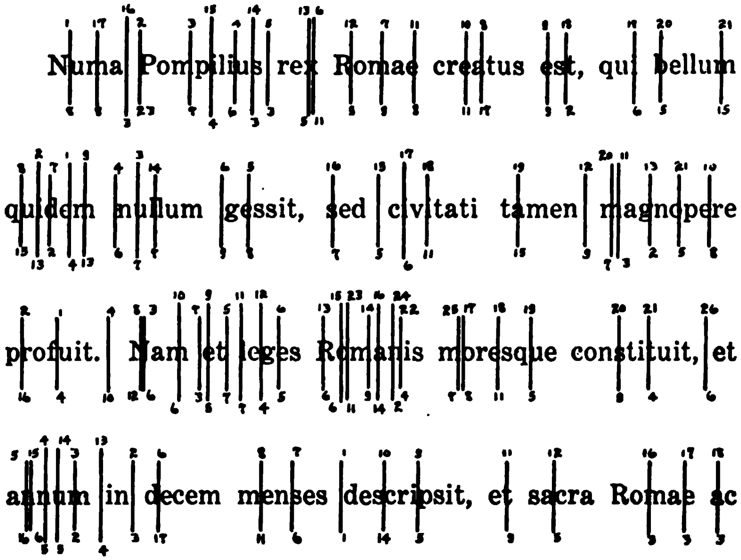

Numa Pompilius rex Romae creatus est, qui bellum
quidem nullum gessit, sed civitati tamen magnopere
profuit. Nam et leges Romanis moresque constituit, et
annum in decem menses descripsit, et sacra Romae ac

PLATE 78.—Record of Subject A35 reading silently a simple Latin passage

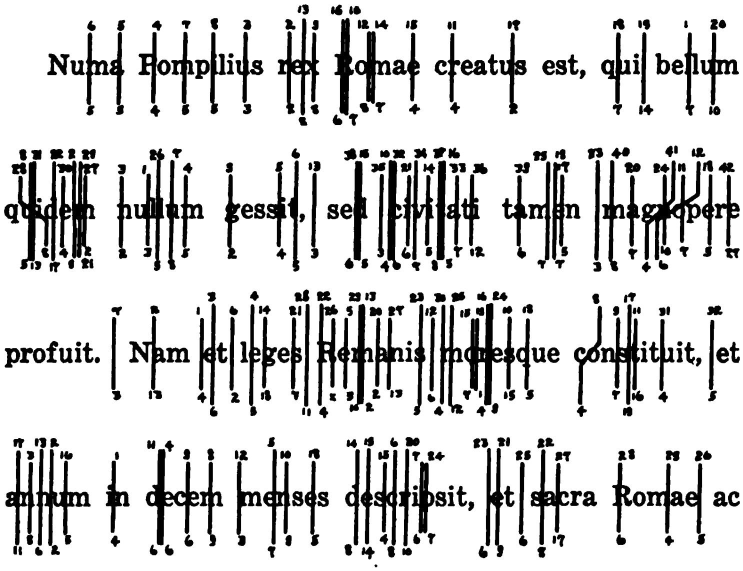

Numa Pompilius rex Romae creatus est, qui bellum
quidem nullum gessit, sed civitati tamen magnopere
profuit. Nam et leges Romanis moresque constituit, et
annum in decem menses descripsit, et sacra Romae ac

PLATE 79.—Record of Subject A35 translating orally a simple Latin passage

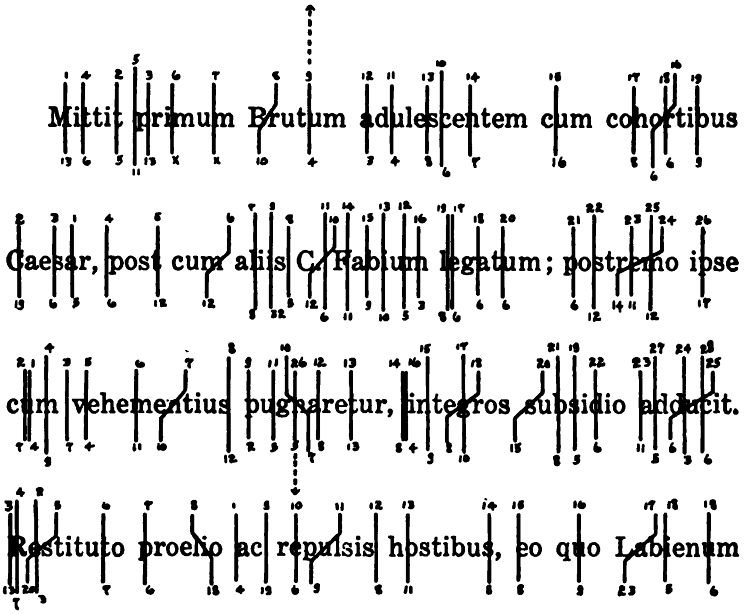

Mittit primum Brutum adulescentem cum cohortibus
Caesar, post cum aliis C. Fabium legatum; postremo ipse
cum vehementius pugnaretur, integros subsidio adducit.
Restituto proelio ac repulsis hostibus, eo quo Labienum

PLATE 80.—Record of Subject A35 pronouncing the words in a Latin passage

The subject wanders about among the Latin words. One can imagine vaguely what would happen to a reader's thinking if he wandered about an English line in the same fashion.

The other Latin records are all of the type of those exhibited. There are no Latin records superior to those exhibited. No student made a passable translation of the Caesar passage.

The significance of these records is not difficult to discover. Latin students are not taught to read. They are trained only to look at words. Not only so, but they are so trained to look at words that it is quite impossible to find any system in their looking. There seem to be no mental devices in their experience for disentangling a complex of Latin words. Of course, the chief instrument used for this purpose in ordinary school work is entirely withdrawn in these experiments. The student usually depends on the vocabulary at the end of the book for help in translating Latin. From the beginning of his study he is encouraged to use the vocabulary rather than to attempt to carry anything in his mind. The result is that when the vocabulary is withdrawn the world looks like a great confusion.

When series of fixations in apparently chaotic order were first encountered by experimenters dealing with photographs of eye-movements of children who were just beginning to read, someone invented the phrase "periods of confusion" as a descriptive name for the aimless attack of the baffled child who does not know how to solve the mystery of some unintelligible word. "Periods of confusion" will not serve in this case because the confusion is pervasive and permeates whole lines and even whole passages.

Indeed, we have come to these extraordinary exhibitions of forward and backward movements gradually enough so that it is possible to understand their meaning. The numerous irregular movements of the eyes show that the subject is trying to break up the situation into elements. If he were dealing successfully with the reading matter and were able to extract meaning from the words before him, he would move his eyes in steady, progressive, forward steps. But he is not successful; hence he must go back and forth in the attempt to analyze. Again, if his analysis were successful, he would, to be sure, be delayed by the exacting demands of analysis, but he would ultimately make progress. The evidence is clear that analysis is not successful in these cases. The reader does not know what the elements mean, and ultimately his eye-movements take on the character of mere helpless wandering.

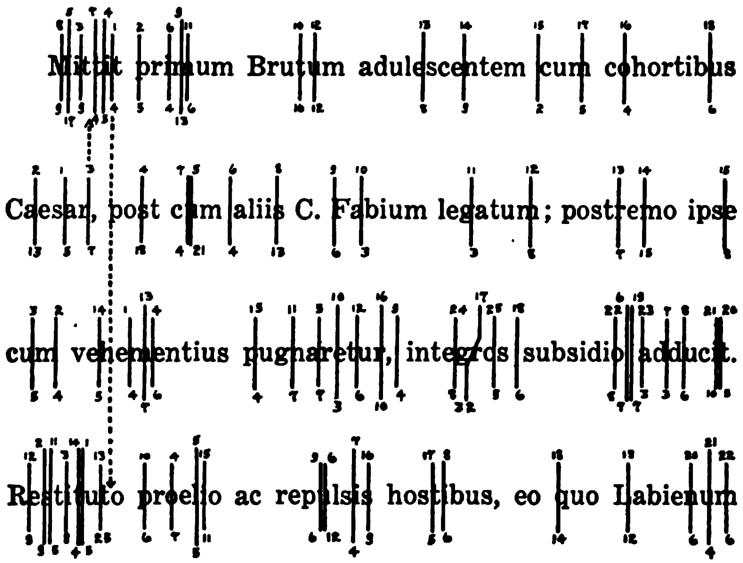

Mittit primum Brutum adulescentem cum cohortibus
Caesar, post eum aliis C. Fabium legatum; postremo ipse
cum vehementius pugnaretur, integros subsidio adducit.
Restituto proelio ac repulsis hostibus, eo quo Labienum

Plate 81.—Record of Subject A35 reading silently a Latin passage after pronouncing it.

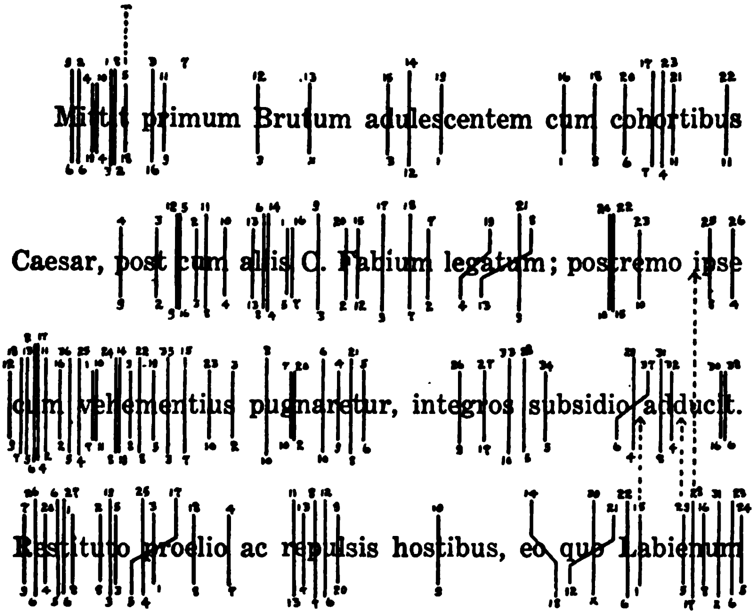
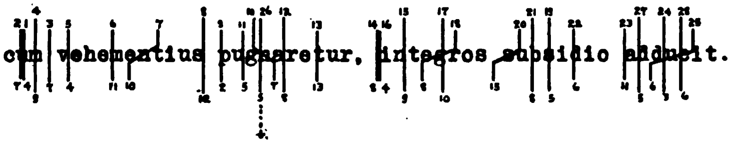

Mittit primum Brutum adulescentem cum cohortibus
Caesar, post cum aliis C. Fabium legatum; postremo ipse
cum vehementius pugnaretur, integros subsidio adducit.
Restituto proelio ac repulsis hostibus, eo quo Labienum

PLATE 82.—Record of Subject A35 translating orally a Latin passage



cum vehe

cum veh

cum vehem

cum vehe
um vehemen

vehementiu

ehementius

tius pugna
ius pugnar

pugnaretur
s pugnaret

ugnaretur,

naretur, i

ur, integr

integros
ur, integr

ntegros su

integros su
subsidio

ros subsidi

s subsidio
ubsidio ad

dio adduci
adducit.

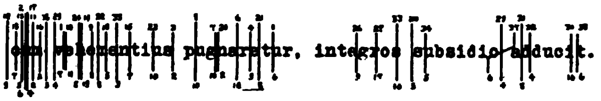
o adducit.

pugnaretu

io adducit

adducit.

PLATE 83.—Rearrangement of the record of the third line shown in Plate 80



um vehemen
cum veh
tius pugna

gnaretur,
aretur, in

ugnaretur,

pugnaretu

us pugnare

vehementiu

um vehemen
cum vehe

cum v
cum veh

m vehementi

ementius p
cum vehem
cum vehe

cum ve
ehementius
pugnaretu

naretur, in

vehementiu

entius pug

m vehement
cum veheme

integros s

ntegros su
ros subsid
sidio addu

ducit.

io adducit
o adducit.

gros subsi
os subsidi
hementius
cum vehem

sidio adduci
adducit.

Plate 84.—Rearrangement of the record of the third line shown in Plate 82

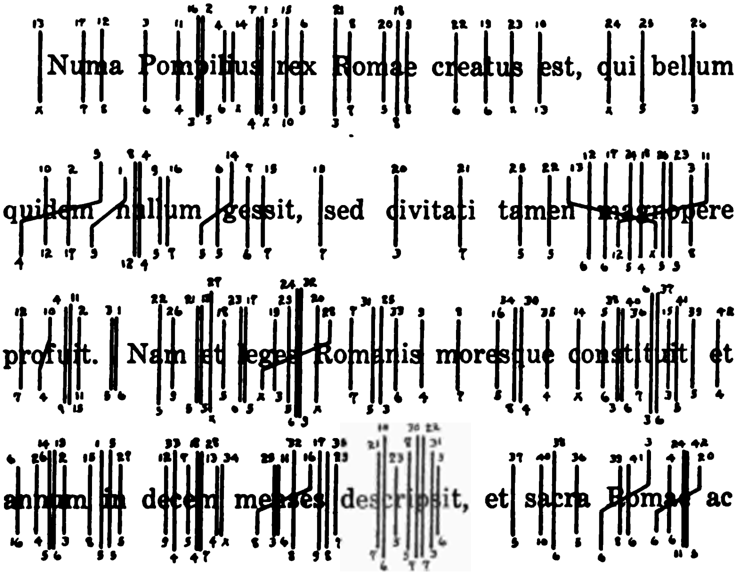

Numa Pompilius rex Romae creatus est, qui bellum
quidem nullum gessit, sed civitati tamen magnopere
profuit. Nam et leges Romanis moresque constituit et
annum in decem menses descripsit, et sacra Romae ac

PLATE 85.—Record of Subject A10 reading silently a Latin passage

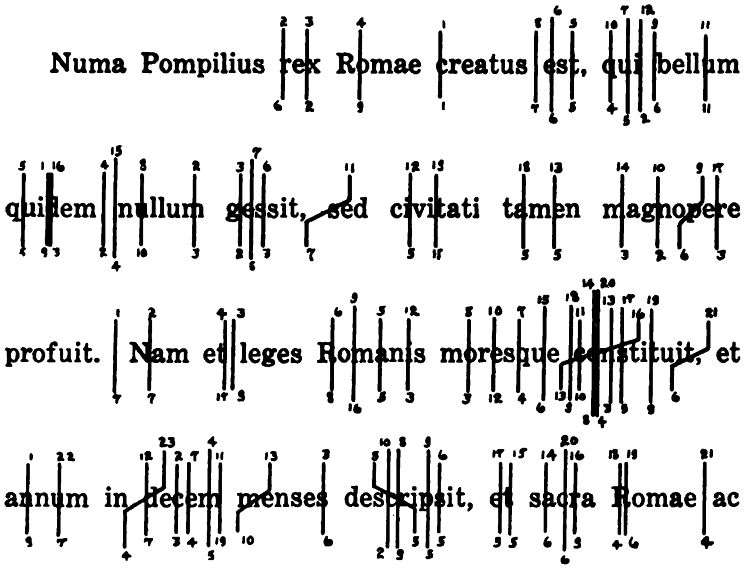

Numa Pompilius rex Romae creatus est, qui bellum
quidem nullum gessit, sed civitati tamen magnopere
profuit. Nam et leges Romanis moresque constituit, et
annum in decem menses descripsit, et sacra Romae ac

PLATE 86.—Record of Subject A10 translating orally a Latin passage

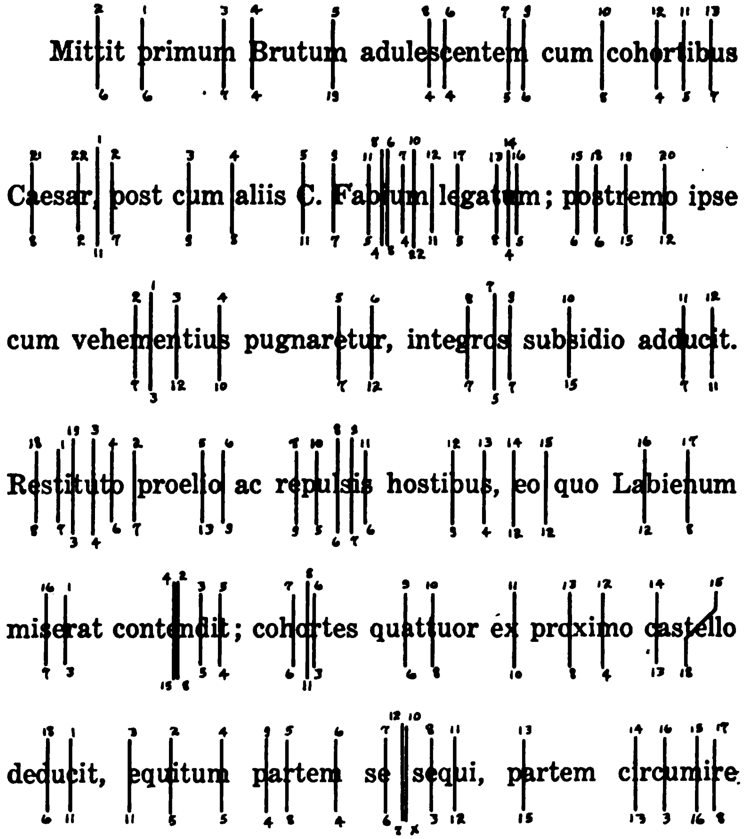

Mittit primum Brutum adulescentem cum cohortibus
Caesar, post cum aliis C. Fabium legatum; postremo ipse
cum vehementius pugnaretur, integros subsidio adducit.
Restituto proelio ac repulsis hostibus, eo quo Labienum
miserat contendit; cohortes quattuor ex proximo castello
deducit, equitum partem se sequi, partem circumire

PLATE 87.—Record of Subject A10 pronouncing a Latin passage

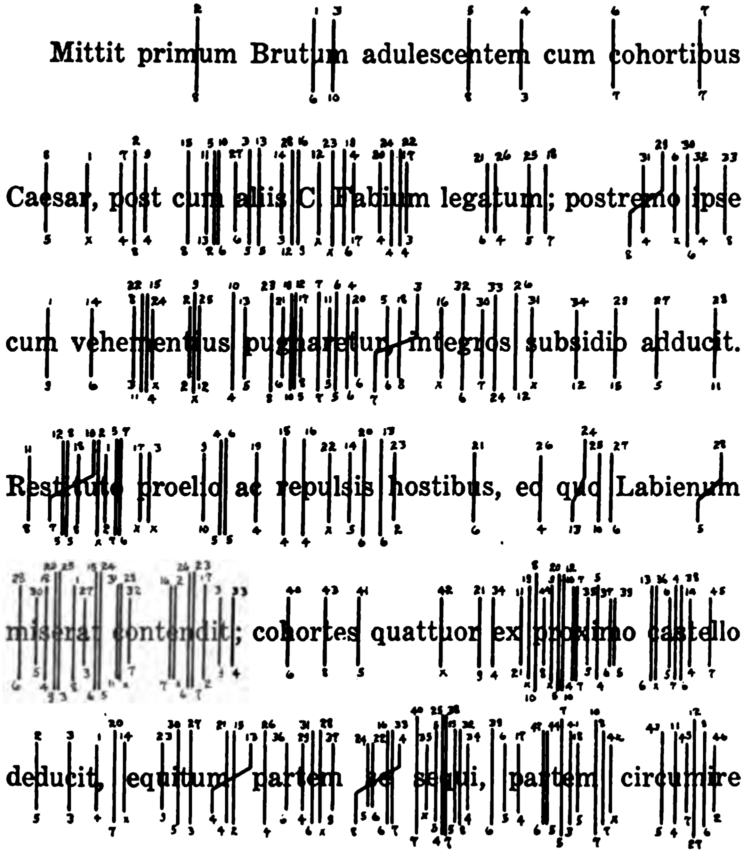

Mittit primum Brutum adulescentem cum cohortibus
Caesar, post cum aliis C. Fabium legatum; postremo ipse
cum vehementius pugnaretur, integros subsidio adducit.
Restituto proelio ac repulsis hostibus, eo quo Labienum
miserat contendit; cohortes quattuor ex proximo castello
deducit, equitum partem se sequi, partem circumire

Plate 88.—Record of Subject A10 reading silently a Latin passage previously pronounced.

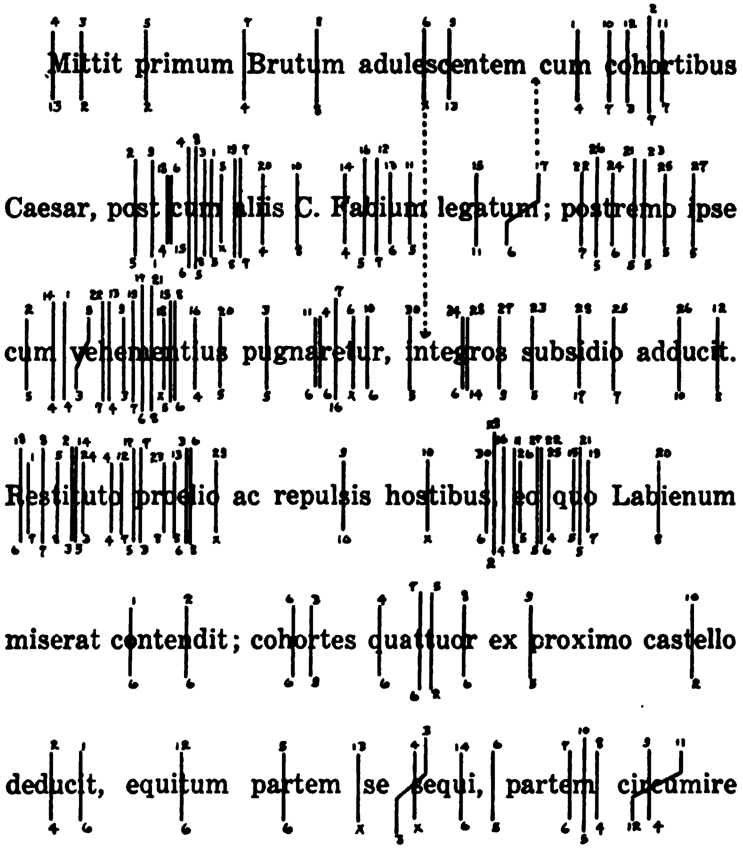
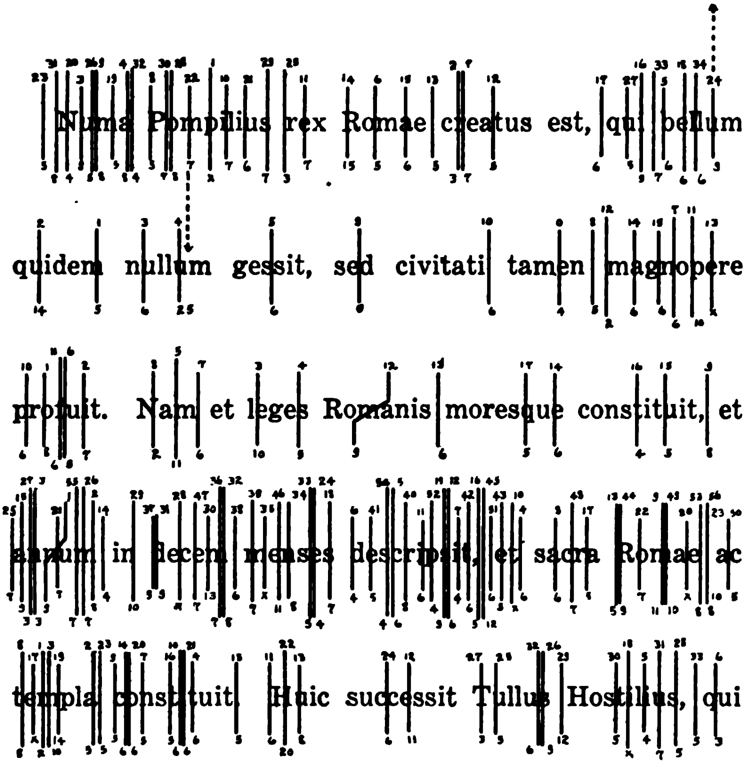

Mittit primum Brutum adulescentem cum cohortibus
Caesar, post cum aliis C. Fabium legatum; postremo ipse
cum vehementius pugnaretur, integros subsidio adducit.
Restituto proelio ac repulsis hostibus, eo quo Labienum
miserat contendit; cohortes quattuor ex proximo castello
deducit, equitum partem se sequi, partem circumire

PLATE 89.—Record of Subject A10 translating orally a Latin passage



Numa Pompilius rex Romae creatus est, qui bellum quidem nullum gessit, sed civitati tamen magnopere profuit. Nam et leges Romanis moresque constituit, et annum in decem menses descripsit, et sacra Romae ac templa constituit. Huic successit Tullus Hostilius, qui

Plate 90.—Record of Subject A21 reading silently a Latin passage

Latin teachers can hardly escape the responsibility for such an exhibit of wasted, and worse than wasted, human effort. It is not possible to believe that the effects of such mental wandering are good for the student. It is quite impossible to look with any complacence on the mental and nervous disorganization which seems to be the major outcome of two and one-third years of training of Latin students in seven high schools of the first rank.

One's imagination halts before the problem of picturing what must be the eye-movements and the mental state of the students at the bottom of the class.

CHAPTER VI

THE TEACHING OF SILENT READING

The title of this chapter is not intended to arouse the expectation that a list of methods will be described which the teacher can take into the classroom and employ in conducting the work of his or her class. It would, indeed, be a worthy task to enumerate such methods, but before that practical step can be taken with confidence of complete success, it is necessary to lay the scientific foundations for school methods in an account of the mental processes which it is the business of these methods to direct. It has long been recognized that the methods of the primary grades must be formulated to train minds which are at the primary level of maturity. The methods of the high school must, no less, be framed to meet the needs of the high-school state of maturity. The present chapter will aim to elaborate this as the fundamental doctrine which must be understood and accepted by all who strive to contribute in any systematic way to the development of school methods.

History shows that in the field of primary methods much progress has been made through the recognition of psychological distinctions. There was a time when primary reading was wholly confused with spelling. In the days when Noah Webster was the dominant influence in primary teaching in this country the psychological importance of reading for meaning had not been recognized by teachers. The methods of teaching reading were accordingly false, and the results were deplorable. Reading in the upper grades of the Massachusetts schools in Horace Mann's day was in about the stage that Latin reading in American high schools is today.

Horace Mann and his co-workers introduced the distinction between spelling and understanding the meaning of words. As soon as this distinction was clearly recognized, spelling and reading began to be taught by different methods and even at different periods in the day.

With the discrimination between the teaching of the form of words, as in spelling, and the teaching of meaning, as in reading, there came a tendency on the part of many to neglect everything except meaning. There have been many recent forms of this tendency to train in recognition of meaning as the sole task of the teacher of reading. But no one can go far in the teaching of meaning without recognizing the fact that there must also be training in the methods of distinguishing complex word forms if the child is to master the more difficult steps in reading. It may be well enough to teach primary pupils nothing but words and their meanings so long as these pupils are brought into contact with only short simple words, but sooner or later there must be cultivated a power of discrimination which will make it possible to use with precision an elaborate set of words. Teachers find, therefore, that the distinction between spelling and reading establishes ultimately the educational demand for two indispensable types of training. Neither spelling nor reading can be neglected if the pupil is to succeed at the higher levels. The distinction is thus established and fully operative as a guide to teaching.

Another distinction which experience has shown to be of major importance is the distinction between words that are heard and words that are seen. There may be all kinds of interrelations between visually apprehended words and words apprehended through their sounds. The natural relations in the primary grades, at the beginning of reading, are determined by the fact that the child is by his pre-school training equipped with many sound words which have vivid meanings for him. If visual words are to have vivid meanings, the natural step is to borrow the meanings from oral words and attach them to the visual words.

A further important fact, also quite in accord with all of the teachings of modern behavioristic psychology, is that meanings are related to articulations quite as much as to sounds. The pronunciation of a familiar word carries with it in many cases a vividness of feeling and interpretation that no hearing or seeing of a word can duplicate. Vocal expression is, therefore, a matter which the primary teacher must understand if methods of teaching are to be as effective as possible.

We are at the stage in the development of primary methods where the relations between audition and visual impressions and experiences of articulations are by no means clear in the minds of teachers. Some there are who would have us teach only oral reading. Others are anxious to bring visual reading into prominence and to discard sounds altogether. Out of this confusion must be brought order through careful experimental efforts. There can be little doubt that for certain purposes oral reading is highly important and should be retained. Equally clear is the conclusion that early in his school experience the child should begin to read without sounds in order that he may cultivate fluent methods of reading of the mature type which he will require in the later grades.

There is thus being developed today a new attitude toward reading in the lower grades which is based on distinctions first pointed out by the students of psychology. The importance of the distinction between oral reading and silent reading is not to be underestimated because we are not yet masters of all of the implications of the distinction. The first step has been taken, and the later steps are sure to follow.

We are already far enough along in this development to begin to see the answer to the question, When does silent reading begin to preponderate in importance over oral reading? All of our scientific studies call attention to the radical changes in the reading attitude which come in the fourth and fifth grades. It is here in normal, trained pupils that independent, silent reading begins to take on marked significance as a separate aspect of mental life. The question arises, What are some of the early aspects of strictly silent reading relatively unattached to oral reading? This is followed immediately by the question, What are the obligations of the school in the perfection of these aspects of reading? An earlier contribution to this discussion was made by Terry[1] when he showed that there are important reasons why teachers should give special attention to the reading of arithmetic problems. The reading of such problems is very different from the reading of ordinary prose. Until Terry drew this distinction, the schools assumed in a vague, general way that reading arithmetic problems is simply one manifestation of the pupil's general reading ability. The moment the distinction is drawn, as a result of scientific studies, it follows that special methods must be developed for teaching the reading of arithmetic problems.

In like fashion, the present monograph has shown that there are manifold variations in the reading process induced by changes in subject-matter other than that change with which Terry dealt, and it has also been shown that changes in the attitude of the reader bring about variations in the reading process.

Some of the distinctions which have been here drawn, such, for example, as the distinction between the reading of geography and the reading of simple prose fiction, are of importance to the fourth and fifth grades.

Other distinctions could be made of use in these and subsequent grades if the schools would resolutely face the task of determining experimentally the steps which ought to be taken for the proper training of pupils.

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[1] Paul Washington Terry, *How Numerals Are Read: An Experimental Study of the Reading of Isolated Numerals and Numerals in Arithmetic Problems*, Supplementary Educational Monographs, No. 18. Chicago: Department of Education, University of Chicago, 1922.

For example, let us consider an important type of reading which may or may not prove to be appropriate to the middle grades, namely, the type which is exhibited when a reader skims a page in search of a particular item or kind of information? There is no more useful practical ability than that of going rapidly over a page, omitting most of it in order to catch the small items which suit one's immediate purpose. Nor is there any more dangerous habit to acquire than that of skimming. Every possible precaution is necessary if a child is to learn when and how to skim systematically. Yet, who knows the most advantageous date at which to introduce practice in this useful art, and who knows the best methods of systematic skimming?

Another matter of importance is the distinction between asking particular questions before the pupil begins to read and giving him a vague, general notion that some question is going to be asked. We have seen in the chapters of this monograph that the general demand that one prepare to answer questions produces a unique attitude in the reader, but we have no exact information as to the effect of particular questions. We can readily imagine that a reader's attention can be largely controlled by specific preliminary statements, such as this: "When you are through reading, I shall ask you about the geographical location of the story." When the problem of teaching reading under these conditions is proposed, the question is to determine experimentally how and when instruction of this kind should be introduced in the curriculum of the schools.

Again, we may suggest a whole series of problems for the teacher of reading by recalling the fact that a reader's attitude is governed in some measure by the suggestion that he read slowly or rapidly. Suppose that suggestions are given, not directly in verbal form, but through prearranged social influences of various types. Suppose, for example, that class competition is used by the teacher to induce rapid reading. What will be the effect? When is such a method of control suitable? How long should it be employed?

Teachers have known for a long time that the process of reading fluently to oneself requires a long period for its perfection, but teachers have not known much about guiding the pupil while he is passing through this period. In fact, the years during which silent reading is maturing have been treated as though they were years of formal and uniform drill. One reads in the books on methodology the statement that the fifth and sixth grades should be devoted to drill in order that the habits acquired in the primary grades may be thoroughly fixed. Such a statement is utterly misleading. Nothing could be less desirable than that the habits cultivated in the primary grades should become fixed. Most of the primary habits are in the nature of intellectual scaffolding and will have to come down sooner or later. Primary habits should be superseded by mature habits. The fourth grade and the subsequent grades are fruitful periods of education if teachers recognize the unique psychological adjustments that these grades have to work out. To lump together all of these significant adjustments under the blind word "drill" is to attempt to define a complex psychological epoch by a simple, formal name. What school methods will have to do is to break up the word "drill" into a number of separate kinds of happenings. These happenings will be first distinguished by the discriminating mind, but, once they are distinguished, the methodology of these grades will be determined, and the reasons for the variety in methods will become common traditions in the schools.

If one may hazard a general practical conclusion on the basis of the material which has been collected in this monograph, one may distinguish the fourth, fifth, and sixth grades from the primary grades by assigning to the latter training in intelligent oral reading, with gradually increasing emphasis on silent reading. There must be throughout emphasis on apprehension of meaning. To the fourth, fifth, and sixth grades may then be assigned the task of cultivating fluent silent reading of various types in preparation for later elaborate forms of analytical study. The grades immediately above the primary should, under this distinction, be grades of much reading of a variety of material. There will, perhaps, be a period of extensive reading of biography with suggestions as to the items for which one should look. There will, perhaps, be another period when pupils will find out the best ways of getting at scientific materials and absorbing them. There will be a period of training in the reading of mathematical material. This statement should be taken literally as a suggestion that someone write an interesting book on arithmetic intended really to be read. There will be no difficulty in finding many other like topics with which to fill a fruitful program for the reading of the middle grades if teachers will once begin to think in terms of silent reading and its different forms.

The fourth, fifth, and sixth grades are probably not periods of elaborate analytical study. It would seem to be natural to give a great deal of mental content before attempting analysis of content. Such complexities ~~in~~ reading as were outlined in Chapters II and III of this monograph probably ought to be thoroughly mastered before the later processes discussed in Chapter IV are attacked.

One has no right, however, to hold dogmatically to such a suggestion. The scientific attitude toward applications of scientific distinctions is one which leads to experimentation. The only conclusion that can be reached with absolute assurance is that the teaching of the grades above the primary must be directed to a definite, detailed consideration of a series of distinctions that break up silent reading into many different kinds of acts. These many acts require systematic cultivation by methods appropriate to their character.

After mastery comes use. The art of silent reading having been measurably perfected in the fourth, fifth, and sixth grades, the next problem is to carry reading into its various possible applications.

Here we encounter what is perhaps the most dangerous obstruction to a rational reading program, namely, the conventional American textbook. The ordinary textbook is not written to be read. It is made up of compact, abstract statements and lists of items. The student cannot cultivate, while trying to use such material, habits of fluent reading. He will constantly be making analyses in order to get the details of each line. The assumption seems to be that the limitations of the textbook will be overcome during the recitation period when the teacher is supposed to fill in the outline presented in the textbooks with informing illustrations. Even if this assumption were in accordance with practice, reading habits would still suffer from lack of proper cultivation, for the recitation is seldom, if ever, a period of reading.

In sharp contrast with both the recitation and the minute analytical examination of the materials in the textbooks is the library method of getting an education. In the last few years teachers have come to realize that the pupil trained in library methods has a kind of intellectual independence which is most valuable. High schools have shown their appreciation of this new method of instruction by adopting an unsystematized use of the library. Ordinarily teachers do not go with the pupil to the library and guide him in the methods of effective use. They send the pupil and depend on chance for results. Even under these conditions very promising returns come from library assignments.

The fortunate effects of library work are likely to lead in due time to changes of far-reaching importance in school methods. Teachers will soon begin to realize that library methods are not only worth cultivating but also worth cultivating systematically and by carefully formulated methods.

Along with fluent reading of much material will have to be cultivated analytical study. What has been said in earlier chapters regarding analytical study should not be misunderstood as a plea for the termination of all school efforts to cultivate analysis. There is no justification for the elimination of analysis. What must be done is to find a proper opportunity to perfect analysis. Neither analysis nor reading will be properly cultivated if they are confused with each other. The distinction is of the highest importance as a guide to proper methods.

Numerous examples of the confusion of analysis with reading to the marked disadvantage of both can be found in the schools. The English classics, which are supposed to be read by high-school students in order that they may become acquainted with the best social traditions and ideals of our race, have been prostituted to the uses of grammar and the most formal rhetoric.

Science, which, in the hands of a Huxley, can be made the most fascinating kind of reading, prides itself in some cases on its utter formlessness and its repellent modes of exposition.

As for algebra and geometry, the ordinary teacher would think it strange if one prophesied that some day someone will write a book on these sciences that can be read. Why should this not be possible, as well as that the individual mathematician, when not operating in his professional capacity, should sometimes in a purely personal way give his lay friends a few glimpses into the meaning of Euclidian assumptions and of such mathematical concepts as infinity and zero?

Without attempting to exhaust these remoter possibilities, however, it is perfectly clear, in the light of facts now at hand, that the high school should draw some distinction between reading and analytical study. There is a time and place for each. For example, when a pupil takes up an assignment in history, what shall he do—read it through first fluently and without analysis of details or begin at once to pick out and arrange in order all of the minutiæ? It is fair to assume that at the present time the conscientious student considers it almost immoral to read through an assignment rapidly for the sake of getting a general sketchy idea of the whole matter. The only pupil who has the hardihood to read the lesson rapidly is the one who is caught with only a few minutes in which to prepare as best he can for the recitation. Yet it is not only quite moral, but probably very advantageous that the pupil read rapidly the whole assignment before he comes back to detailed analysis.

Again, there is ample justification for a plea that much reading of English classics be encouraged, with all analysis omitted until the pupil gets some habits of appreciation. Suppose that he does not understand every passage the first time he reads it, or even the second time. Let anyone who has really matured his taste for some aspect of literature describe the pleasure of the discoveries that come with re-reading, and the proper method of dealing with literature in the schools will begin to be understood. The time ought to come in our schools when there will be much reading of belles-lettres in the school unmixed with rhetorical pedantry.

The literary studies which carry the student into foreign languages present many ~~a~~ complex problem. The results of photographic studies of French and Latin reading and analysis reported in this monograph show in a very striking way how the oldest subject of instruction in our high schools has set an extreme example of a type of treatment wholly opposed to reading. Pupils do not read Latin. One can dismiss as absurd under existing conditions the idea that the ordinary pupil ever gets any literary thrills out of Latin. The whole subject has degenerated into an absolutely formal exercise in linguistic dissection. It is doubtful whether this generation of Latin teachers can be made to understand the extent to which they have ruined their subject. If the war had not put an end to the rapidly increasing study of German in the schools, it is doubtful whether Latin could have saved itself, even by this date, from the fate which has overtaken its companion, Greek.

It is nothing less than preposterous for schools to consume the time of students and leave them with the handful of ashes that Latin gives them in its present third year. Latin has lost its vitality. It is a series of barren exercises in analysis of grammatical forms; students are kept busy in the mere piecing together of English words picked out one by one from a vocabulary. It is the example par excellence of lean years of analysis that have fed without profit on all of the accumulations of a child's intellectual life.

It would be less harmful to the school if Latin could be isolated and treated in terms of its own decline. But under existing conditions, it is a source of contagion to the whole school. Latin dominates all of the literary subjects and by its methods contaminates the procedure in every class where its influence is felt. There is a stiff and rigid analytical formalism in much high-school work because teachers in the literary fields think they must be as Latin teachers are.

There must be a time in the study of a language when students and teachers alike want to get some meaning from the text. The French teachers may not be perfect in their art, but the French students show that they are able to read and that they are interested in the story told by the French words. French teachers have had a hard time emancipating themselves from the Latin traditions. Some of them have not yet achieved liberation, but the time is coming and seems to be at hand when the French teachers will take one fork of the road and leave the Latin teachers to go their lonely way.

With such suggestions as these, the task of the experimental psychologist is to turn over to the schools for fuller refinement and use the distinctions which his laboratory investigations have established. This is not the place where one may properly assume to prescribe school procedure; that task must be left to experimentally accumulated experience. The present study has contributed to teaching methods only indirectly. It has set up distinctions in silent reading and has tried to amplify its own findings by suggesting examples other than those with which it deals directly. It is hoped that the classroom teacher will not be alienated by the fact that the distinctions with which this study has been chiefly concerned were made with the aid of elaborate scientific apparatus. It is always most arduous to draw the initial distinctions in any field. Scientific apparatus is essential to first studies. Once the initial distinctions have been drawn with the aid of rigid scientific studies, the later distinctions become increasingly easy of discovery and description.

The classroom teacher can contribute very largely to the continuation of such studies as are reported in the foregoing pages. In this sense the whole monograph may be said to be aimed at the practical initiation of more precise methods of meeting classroom situations.

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By

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ERNEST F. HANES
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THE MAJOR LINES OF EXPERIMENTATION IN THE LABORATORY SCHOOLS

HENRY CLINTON MORRISON
Superintendent of the Laboratory Schools, University of Chicago

The University of Chicago maintains a system of two schools, elementary and secondary, as a laboratory for general educational experimentation.

The University Elementary School at present comprises a kindergarten and six grades. The University High School includes Grades VII to XI, inclusive. Pupils are normally graduated at the end of the eleventh grade.

The constituency of the University High School is derived from the University Elementary School to the extent of approximately three-fifths. The remainder comes chiefly from the Chicago elementary schools. More and more of the latter element is being admitted at the seventh-grade level.

Economy in the process of general education.—Economy is usually an essential condition in the life of a happy and prosperous society. In a society which devotes as large a part of its energy as does our own to the maintenance of schools of various sorts, economical conceptions of the process of education, of its procedure, and of its administration become so important as to be decisive of the possibility of maintaining the educational program at all.

Nor is economy to be viewed merely as the saving of money. It is that, and it is more. It implies, in the first place, the minimum use of the student's time consistent with the delivery of desirable educational products. It is a serious matter to monopolize the time of students up to the twenty-third year of life for general educational purposes, especially in view of the fact that from one to four years of special preparation are often yet to come. Aside from the implications in the life of the individual, which are many and important, society must assume, not only the burden of the cost of his education, but also that of the maintenance of the student; and it must further make up for withdrawing him from productive activity over a considerable period of years. With the rapid approach of approximately universal schooling in higher institutions, this phase of the problem becomes critical. Such expenditure of time may be socially economical, but the burden of proof is upon the educator.

Economy implies the maximum educational development of the student during the time he remains in school; that is, it implies educational efficiency.

Since both the student and the school are creatures in an economic world, the continuance of education as a social institution depends on the generation of powers which are either immediately available for economic productivity or translatable into terms of such.

Broadly speaking, then, the comprehensive statement of experimentation in the laboratory schools is *economy in the process of general education.*

Fundamental assumptions.—One cannot economize merely by denying. The school differs from every other laboratory in that it must always be generating its own institutional product. It is not a place set aside, like the industrial or the agricultural laboratory, in which experimentation is the whole story and the ordinary product of the plant does not matter. In other words, it must be a school as well as a laboratory. Hence, it is bound to have its own assumptions as to educational objectives as other schools do. These may be stated in their purely intellectual aspect, as the writer interprets them.

1. A rational apprehension of the obvious aspects of the environment.
2. Appreciation of some part of the cultural inheritance of the race.
3. Training in the typical modes of thinking which the civilized man employs.
4. The acquisition of as many as possible of those tools of learning which are useful for the acquisition of a broadening contact with the life of civilization and for the accurate and lucid expression of thought.
5. The development of the power of effective sustained application to the study of intellectual material.
6. The discovery of a range of sustaining individual intellectual interests.
7. The ultimate development of capacity for responsible independent study.

It is further assumed that the acquisition of such powers, understandings, and appreciations implies actual and real acquisition and not fictitious and partial acquisition.

The reader must not infer that the list of assumptions as thus outlined is a statement of educational philosophy. Other schools, as schools, might subtract from the list; more schools would probably add to the list, especially such items as are associated with vocational training. Other writers might properly set up other objectives, such as bodily well-being, which the present writer is inclined to think are implicit in the list which has been given.

It is further assumed, until the contrary becomes apparent, that the typical American secondary curriculum is adapted to the attainment of the objectives which are thus in mind. Only, the school definitely declines to interpret the units of the curriculum as necessarily and adequately defined in terms of time spent. When an individual pupil is shown to possess the attainments evidently contemplated by a given unit, such, for instance, as a year in English composition, he is credited with the unit.

The problem stated.—Such being the assumptions, the major problem comes in substance to be: How many years are required and what expenditure of money and energy is necessary in order that these substantial and tangible results may be achieved?

The nature and forms of experimentation.—Educational investigation is no single task. It is at bottom a study of: (1) An organism, to wit, the individual pupil, his various modes of reaction, his adaptive processes, his inhibiting conditions, his mental and physical development; (2) a larger organic structure, society, into which the individual must grow as a productive and regenerating member; (3) a multitude of processes which constitute the broad field of pedagogy, both materials and technique; (4) a coherent institutional organization which we call the school.

Psychological and physiological investigation.—There is, accordingly, always going on in the laboratory schools psychological and physiological study of the pupils. While much of this type of investigation is carried on in the schools by graduate students in the Department of Education and by members of the faculties of the laboratory schools, the more precise studies are conducted by members of the faculty of the Department of Education and reported by them in independent studies.

This form of investigation is, of course, fundamental and out of it grow, first, the suggestions and, second, the checks on all other forms. The possibilities in this field are very great as bearing on the specific problem with which this section of the monograph deals. While some very important contributions have been made, the ground has scarcely been scratched.

Pedagogical investigation.—The field which is probably most often thought of as peculiarly that of the laboratory school is the broad field of pedagogical investigation and experimentation.

One finds it hard to mark off areas in this field and study them each with respect to its own particular problems. Scarcely any investigation can be confined to the field of classroom technique, for instance, and ignore implications which belong in themselves primarily to the curriculum, or others which have to do with the content and organization of the material being taught, or others, indeed, which call in question the possibility or even reality of the educational objectives assumed. Every such investigation is a course or series of courses being taught in the school. Any such may throw light on improvement in technique, or its chief disclosure may be that the material is unsuitable, or it may raise questions regarding the placing of the course in the curriculum. Such phases of investigation are illustrated in this monograph. The contributions of Beauchamp and of Hanes and McCoy deal with different aspects of the technique problem. Breslich's article records the approaching completion of a stage in the process of more economical placing of material in the curriculum and the results thereof. Hill and Barnard record the tentative conclusions of a seven-year study in which there has been worked out an economical conception of history courses for the secondary school.

Method and limitations of pedagogical research.—Pedagogical research cannot be organized for attack after the method of storming parties, nor can it optimistically claim to settle questions seriatim once and for all. It must patiently experiment under singularly exacting and complex conditions, interpret results as wisely as possible, seek light in other fields, restate its problems, and continue.

The physicist deals with materials about the objective character of which he is seldom in doubt, and he can employ methods which the maturity of his science has made exact.

The biologist can do what he will with his organisms; he is under no restrictions as to the fate of his materials. The physiologist can experiment on the lower animals until he has reached that degree of reasonable assurance which justifies him in applying his procedure to man.

In pedagogical study, the investigator deals of necessity with humanity throughout. The schoolmaster can never institute experimentation, the result of which he knows beforehand must be detrimental, not to say fatal, to either his control group or his training group. His own ethics will not permit; he would presently experience a permanent lack of subjects were he not otherwise inhibited. The history of experimentation is not wholly devoid of illustrations.

The controlled experiment which has been the mainstay of so much scientific investigation is of very limited adaptability to this field. It has, indeed, contributed important illumination; it is still useful, and with extremely critical use it may become more useful for the study of very specific issues set up in the course of other forms of investigation. The method is singularly apt to be used uncritically by students who are not fully aware of the school and of the complexity of its processes. The literature is not without illustrations of this point, especially in those cases in which the investigator has ignored either the efficiency or the propriety of the teaching technique employed.

The chief limitation of the controlled experiment as a method of pedagogical investigation may perhaps be pictured in the following manner.

It is exceedingly difficult to raise an issue in the teaching process which is sufficiently definite. Most issues are apt to be deceptive as to complexity. Thinking that we have a perfectly simple issue, we carry on the experiment, over a period of months it may be, and in the end the findings are disappointing. Other investigators find disparate results with the same procedure. What seemed simple may well have been complex. For instance, the following problem: A comparison of the direct and grammatical methods of teaching first-year French. The result of experimentation under the control-group plan on any such issue could hardly fail to be inconclusive and unconvincing, whatever the outcome. The terms, apparently simple, are actually complex and undefined. There is no defended assumption as to the test to be used as the criterion. If the problem were stated as follows, some light might be shed: Assuming that the objective in first-year French is maximum ability to react to the meaning (defined) of French discourse, as measured by such and such test, will a given direct method (defined and procedure defined) prove more economical than a given grammatical method (defined and procedure defined)? Obviously, an issue thus hedged in can have only the most limited application. Hence the adaptability of the method for settling minor details in broader forms of investigation.

The literature of transfer problems investigated by this method has numerous instances which will illustrate the point here made.

Second, the circumstances of the control and training groups must be reasonably accounted for. Unless we are disposed to insist on a degree of precision which is out of proportion to the precision with which the issue can be stated, this part of the problem is relatively easy.

Third, problems for investigation by the control-group method ought to arise out of some more general systematic inquiry. Otherwise, investigation is apt to spend itself on problems set up rather by the curiosity of the investigator than by the needs of a larger purposeful inquiry. More than that, such isolated investigation, most often perhaps, deals with problems which have one answer when taken by themselves and quite another answer when seen as parts of a larger problem. For instance, much may be true of spelling considered as spelling which is only in part true of spelling conceived as one factor in a pedagogical complex of which the other two are reading and composition.

The method used in the laboratory schools.—So we come to the method chiefly used in the laboratory schools. A course is set up with material and a technique which are believed to be calculated to achieve certain desirable objectives, objectives which are themselves canvassed in the light of the major purpose of experimentation and the current views of the wider pedagogical community.

An abundant record of material, procedure, and student reactions is kept. Frequent departmental conferences are held and further conferences with the executive officers and interested members of the faculty of the Department of Education.

Evidential material of all sorts is gathered, including not only test results but other pertinent evidence. The free reading by pupils in the large school library furnishes much such evidence. The unsupervised intellectual activities of students furnish something. The accumulating individual case histories reveal significant material.

Meantime, psychological investigation and the results of an occasional control-group experiment sometimes point the way to a modification of procedure or even to the erection of a revised set of objectives.

At the end of a year certain facts of experience should stand out more or less clearly. Material and technique, and it may be the curriculum, are modified, and a new course is set up. The reports made by Breslich and by Hill and Barnard in this monograph record the results of the kind of investigation which has been described, running over a period of years.

The results are in the form of courses and procedure which work. Progress is relatively rapid, and persuasion of the pedagogical community is wholesomely slow. The method yields little directly in the form of knowledge of the nature of the learning process, though it is not entirely barren of such. It is not refined. It does furnish a ready, reliable, and systematic guide to the problems needing investigation by other and more specific methods.

Economy implies efficiency.—One cannot economize by sentimentalizing. One cannot meet the issue by merely evading a part of his educational responsibility. A school which actually generates in its students the qualities and powers which appear in its list of educational objectives, requiring many years and much money for the purpose, may be vastly more economical than the school which half accomplishes its task and does it in one-half the time and at one-half the expense. And so we find the University High School at work on four forms of productivity which relate themselves primarily to efficiency as well as to economy. These are: better and more economical material, better and more effective technique of teaching, individual personnel study, and more effective institutional organization.

Production of material.—The American teacher is singularly dependent on the printed page. Perhaps for that reason, the one line in which American schools have most definitely experimented has been in the production of textbooks tried out in the classroom. The activities of the laboratory schools have not greatly differed in this matter from those of hundreds of teachers in scores of other schools. They have differed in the following respects:

1. Production has regard to economy as well as to effectiveness and salability. Books are frankly being made, not primarily to meet a demand, but rather in the hope of creating a demand which ought to be made. The economy motive is illustrated by the way in which Breslich has slowly and patiently worked out his mathematics material. At the time of writing, it has been brought to the point at which it may be used to cover pre-collegiate mathematics by the end of the ninth grade, and all of the mathematics taught in the Freshman and Sophomore years of the University of Chicago by the end of the eleventh grade.

2. It accepts the principle of constant revision under continued experimentation.

3. It has the benefit of constant laboratory studies made by the Department of Education and of the co-operation of several departments in the University, particularly in the direction of experimentation with college-entrance requirements.

4. It is carried on in the light of a systematic classroom and institutional teaching technique as applicable in its several forms to one high-school department as to another.

Illustrations of material produced in this way, other than that already mentioned, are: Bovée's *Première Année de Français*,[1] Hill's *Community*

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[1] Boston: Ginn & Co., 1922. Pp. xx+546+36.

Life and Civic Problems,[1] Beauchamp and Pieper's *Elementary Science* (in preparation), and Bridge's *Extensive Reading Material for Latin* (in preparation).

Technique of teaching.—It is not enough that material of instruction shall be prepared. It is essential that there shall be worked out a technique of teaching material to the student such that every individual endowed with normal learning powers can be placed in actual possession of the understandings, powers, and appreciations contemplated by the fundamental educational assumptions and by the curriculum in use. Such technique involves the effective presentation of material, the effective supervision of the assimilative process, and the building up of efficient study. capacity. It involves teaching and reteaching to the point of actual tested mastery of the material presented. In the end, the educational effect of material and technique is held to be some modification of voluntary or habitual individual behavior. And so the school sets up measures calculated to observe and record evidences of the ultimate effects of this sort. Experimentation has then its material, its technique of teaching, its current teaching tests, its evidences of ultimate educational effect. It thus finds grounds for modification of material and modification of technique.

Hence, there is not only a classroom technique but an institutional technique. It has been found to be very easy, for instance, to allow the credit system in use to obscure entirely the real educational effect of the school on the pupil. Artificial symptoms are created such that, to that extent, the experimental character of the school is destroyed. Accordingly, an experimental modification of observation and control of the pupil's intellectual development is set up.

Pupil study and adjustment.—We have referred to "pupils endowed with normal learning powers." Not everyone is endowed with such powers. In an essential sense, every student is a problem; but there are extreme variations which constitute definite problem cases with which the school must learn how to deal. They cannot be cast out upon the scrap heap, first, because they are after all human beings; and, second, because society cannot afford the luxury of human scrap heaps. The problem case may be either the non-learner, the near non-learner, or the individual with exceptional special talent. It is not unheard of to find an individual in the two extreme groups at the same time but in different courses.

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[1] Boston: Ginn & Co., 1922. Pp. xx+528+xxxiii.

With the student of special talent or exceptional talent the school does not hesitate to make any possible special individual arrangement consistent with the pursuit of education in its general character. It is concerned as a school to provide for such individual students. As a laboratory it is concerned to work out an institutional technique which will make possible the largest opportunities for such people.

The other type of special problem becomes the peculiar care of the personnel interest of the administrative office. The contributions of Reavis and Smithies illustrate procedure with these cases. The field in which they are working is undoubtedly one of great importance, little worked to date, capable of yielding a harvest of incalculable benefit to many thousands of unhappy individuals and through them to society.

Curriculum-testing.—In its larger aspects probably, in the first instance certainly, curriculum content must be settled outside the school by analysis of the needs of society. In another sense, curriculum content is a matter for experimentation within the school. The curriculum-maker may find from his analysis of social needs that certain objectives must be met by the school. In the present state of our knowledge of institutional possibilities, of student capacities, of the intellectual demands of the objective, he can approximately suggest and place a course. To assert that such and such "should be taught in the schools" less than half settles the question. Not only have the methodist and the technician to have their say as to the inherent pedagogical character and requirements of the new content, but several questions outside their ken must be settled experimentally. It turns out to belong to the elementary school rather than to the high school, or the reverse. It may belong to a different type of technique than was supposed. It may prove to be unteachable in the systematic sense.

The writer, for instance, thinks that there is good reason to suspect that at least three subjects commonly taught in the first six grades do not belong there, that at least two subjects commonly postponed to the seventh grade or later can better be taught before the end of the sixth, that much of the junior-college material can better be taught at the twelfth-grade level or below, and that at least two traditional high-school courses in reality belong to the junior college. Misplacing courses leads to duplication, and duplication is the enemy of economy.

Institutional analysis.—Closely related to curriculum experimentation is the further study of the essential nature of the institutional divisions which have come to constitute the school. What is the elementary school? What is the high school? What is the college? It is well known that our three principal institutional divisions of the process of general education have come to exist more through a series of historical accidents than through any rational process of organization. More recently the junior high school has come into being, in principle, through an attempt to fit an institution to what are believed to be certain inherent characteristics of the adolescent. On the other hand, we find the local junior college growing, much as did the high school in earlier days, to meet a current need, but with institutional assumptions borrowed in the main from the tradition of elementary-secondary-college division points. In so far as there are any real division points, other than those set up for administrative convenience, they must be founded on something inherent in the educative process itself. It may well be that our traditional institutional notions contain elements which do not contribute to the economy of the process as a whole.

In the laboratory schools there are no established assumptions as to when the kindergarten ends and the elementary school begins, as to the division point between elementary school and high school, or as to the division point between high school and college. The question can be and is left open to see what will happen. Certain indications on the main issue appear.

Largely through the activities of the Kindergarten-Primary Department of the School of Education and through experimentation by the teachers of the lower grades of the University Elementary School, it appears rather clearly that there is an initiatory institution with a distinctly identifiable purpose, method, and technique covering the years commonly covered by the kindergarten and first grade certainly—possibly the first three grades.

Again, it appears, on evidence which will be cited later in another connection, that much college work can effectively be done, at least in some cases, at the eleventh-grade level. Hence, the necessity in principle of a twelve-year pre-collegiate course is called in question. Ultimately, the question will be faced: How shall we on the evidence define in functional terms the institution which lies between our present assumed pre-secondary school of six years and our assumed senior college?

Analysis of this series of questions must be left to a later publication. Suffice it for the present to raise the question chiefly as an illustration of the field of experimentation in which the schools are working. This brings us to one of the specific areas in which work has been begun in a tentative way.

In the end it is probable that this whole institutional question must be settled in principle in terms of individual maturity. It is needful to know quite definitely what maturity is, its applications, its manifestations, its periodicity, its forms. We know something about physical maturity in various aspects. We are beginning to get rather striking revelations as to mental maturity, but the field has only just been opened. Our notions of intellectual maturity are simply our preconceptions as to the content of general education. We have not yet squarely raised the question of social maturity. The problem far transcends the scope of the experimental school. It calls for effective collaboration in many fields of inquiry which deal with the study of man. It is perhaps the fundamental question on the answer to which the development of an efficient and economical educational system depends. Indeed, more is implied, for untold consequences hang on the age at which the youth of the race can best enter adult society as a family head and a productive unit.

In sum, then, while the dominant and inclusive purpose of experimentation in the laboratory schools is economy in the process of general education, the nature of the larger study itself reveals important products in (1) the methodology of pedagogical experimentation, (2) the nature of the growing child and youth and his normal methods of learning, (3) certain abnormal or unusual learning traits, their identification and treatment, (4) the preparation of convenient material of instruction, (5) the analysis and development of instructional technique for the normal pupil, (6) the rearrangement of curriculum units, and (7) rational definition of institutional characteristics and boundaries.

All of the foregoing experimentation, in so far as it has modified the material and technique and institutional organization of the University High School, has contributed to the solution of our main economy problem. Economy might, for instance, have revealed itself as a shortening of the school career. Some material progress in that direction can be reported.

Elimination of a grade.—In the years prior to 1914, the laboratory schools as a system had consisted of a kindergarten, an elementary school of eight grades, and a high school of four grades. The constituency of the University High School then as now came in part from the University Elementary School and in part from the Chicago public schools. There have always been, of course, some scattering individuals from other schools. During the year 1912–13 it came to be believed that the seventh grade of the Elementary School was in all essentials as well prepared for the High School as was the eighth grade. Some special adjustment work was done, and at the beginning of the school year 1913–14 both grades were promoted together. There was thus inaugurated a 7-4 system. It also resulted that four years later a class was graduated from the University High School composed of two groups, one of which had been in school eleven years and the other twelve years. We thus have a four-year check on the two groups so far as the records of school grades will serve. The records of the school were at that time kept in terms of percentile grades. The final standing of a pupil for each succeeding year was recorded as a cumulative grade; that is, it represented his average standing from the beginning of his school career.

TABLE I

Year	Twelve-Year Group		Eleven-Year Group	
	Mean Standing	Range	Mean Standing	Range
First	80	63–95	81	67–90
Second	79	65–92	80	69–88
Third	78	67–80	79	60–89
Fourth	78	62–90	79	70–89

Table I exhibits the mean standing of each group for each of its four high-school years. There is little difference between the two groups, but such as there is favors the eleven-year group.

TABLE II

	Twelve-Year Group	Eleven-Year Group
Percentage of students graduated in less than four years	13	4
Percentage of students who showed distinct gain from year to year	26	19
Percentage of students who held their own	22	35
Percentage of students who had distinctly lower grades from year to year	39	42
Number of students dropped from the school	2	2

Analysis of individual records tells a somewhat different story, but not markedly different. Table II shows some superiority in the twelve-year group, but it is not much, and the numbers involved are too small for narrow comparisons in terms of percentages.

On the whole, it is clear that the eleven-year group suffered no material detriment from their shortened course as compared with their fellows, so far as their recorded high-school standing shows. They might have shown an appreciably lower grading and still left it evident that the saving of a year would be justified. Subsequent experience is confirmatory. Four additional classes have now been graduated under the 7-4 plan, and there has been no cause to think that standards of scholastic effectiveness have been lowered. So far as the writer knows, the question has not seriously been raised.

The records of sixteen of the eleven-year pupils have been traced through the University of Chicago. All were included who have a record there, although there appears to have been some migration to and from other undergraduate schools. Nine have records for four years in the University. One was dismissed for poor work. The mean standing in grade-points[1] for the remainder is shown in Table III. Of the nine who received the Bachelor's degree in 1922, four were graduated with honors.

TABLE III

Year	Mean Standing in Grade-Points	Range
First.	27.8	16–48
Second.	46.1	16–92
Third.	76.0	29–141
Fourth.	116.0	86.5–181.5

We may compare this group with the corresponding group which originated in the University Elementary School and graduated from the University High School the preceding year at the end of a twelve-year course. There were fifteen of these students, and twelve received the Bachelor's degree in 1921. Four of the twelve appear to have returned to the University after sojourns in other institutions. One student from

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[1] The following tabulation shows the relation between grades and grade-points:

GRADE	NUMBER OF GRADE-POINTS			
	First Year	Second Year	Third Year	Fourth Year
F.	−18	−36	−54	−72
E.	− 9	−18	−27	−36
D.	0	0	0	0
C−.	9	18	27	36
C.	18	36	54	72
B−.	27	54	81	108
B.	36	72	108	144
A−.	45	90	135	180
A.	54	108	162	216

this group also was dismissed from the University for poor work. Of the remainder, the mean standing in grade-points by years appears in Table IV. Of the twelve who graduated, two attained honors.

There is little or no difference between the two groups. Such as there is indicates that the twelve-year group was perhaps slightly better prepared in the routine sense and that the eleven-year group had perhaps more brilliant students. The evidence shows no material superiority of one group over the other so far as the preparation for college work is concerned. A partial adherent of the eleven-year plan might argue that the analysis shows a better educational situation for the eleven-year group. The evidence shows rather clearly that one group prospered as well with eleven years of pre-collegiate training as the other with twelve. Subsequent experience with other classes has yielded no reason to think otherwise.

TABLE IV

Year	Mean Standing in Grade-Points	Range
First	31	14–47
Second	54	33–86
Third	66	6–153
Fourth	101	17–166

Readjustment of class grades.—The process just described, by which a grade was eliminated, had sufficient precedent in American school organization to justify the experiment with a prognosis of success. One would expect that further experimentation would proceed along the same line and that successive grades would be dropped until a point should be reached at which the disadvantage would be clear. Such a course would sooner or later involve serious detriment to some class of fifty or more children. There is no considerable precedent for thinking that another grade could be dropped, and there is much reason to doubt if it can successfully be done. On the other hand, experimentation in institutional adjustment might be made by reorganizing the distribution of grades between the two schools without prejudice as to the precise institutional character of the work to be done.

Accordingly, a reconnaissance was made during the year 1919–20 by sending a half-grade to the University High School for adjustment and, further, preparation was made during the second semester of that year for sending the other half of Grade VII and promoting Grade VI A to the High School. Thus, the school year 1920–21 started with a full seventh grade in the High School.

During that year and the succeeding year, these pupils were given a home room in the High School. No other class has such. The material of instruction was adapted experimentally to their use. In general, they carried a modification of the courses previously followed by the eighth grade. Two years of experimentation have made it clear that the home room can be abolished and that all courses previously open to the eighth grade, and once open to the ninth grade, can be opened to them, with the following qualification. A modified mathematics material calculated to cover the pre-collegiate content in principles has been organized, and this course begins with Grade VII.

Thus the school system is for the time organized on a 6-5 basis, with some junior-college work in the eleventh grade.

A classroom technique has been organized which gives superior attention to the individual pupil and which is predicated on mastery or non-mastery by each with testing and reteaching to the mastery level. Opportunity for excess credit at mastery level for the more successful pupils is opened. Thus percentile grades disappear. Table V shows the results of two years of work expressed in terms of relative failures in each of the five grades in the school. This table is published at length, for there is in it, in the mind of the writer, much significant material which we have not the space to discuss here.

The tabulation of failures, especially for 1921–22, is purposely taken at the gross figures, to the end that the statement and the argument based on it may be well within the truth. In 1922, especially, a succession of epidemics resulted in a large number of failures which should really be classed as incompletes.. In the school year 1922–23 the students in many cases will discharge their incompleted courses. A similar situation in 1920–21, though less aggravated, was, of course, cleared up during the year 1921–22. On the other hand, the Senior classes in both years completed all subjects possible in order to graduate. Hence, the real comparison between years lies in the respective eleventh-grade classes.

However, our main concern is with the seventh grades which were promoted to the High School after a six-year elementary course. It will be noted, in the first place, that the percentage of failure in this grade is higher than in subsequent grades. This is to be expected. It reflects a condition commonly found in first-year high-school classes.

Note, second, that the percentage of failure in Grade VII is much less than that commonly found in ninth-grade first-year classes; it is,

TABLE V

	First Semester		Second Semester	
	1920–21	1921–22	1920–21	1921–22
	Grade VII			
Number of students carrying four courses	53	63	45	57
Number of students carrying three courses	18	1	18	6
Number of students carrying two courses	1	....	1	....
Aggregate number of courses	268	255	236	246
Number of course failures	18	24	19	21
Percentage of failure	6.7	9.4	8.1	8.5
	Grade VIII			
Number of students carrying four courses	71	45	63	60
Number of students carrying three courses	14	18	20	3
Number of students carrying two courses	....	1	1	....
Aggregate number of courses	326	236	314	249
Number of course failures	11	14	6	8
Percentage of failure	3.4	5.9	1.9	3.2
	Grade IX			
Number of students carrying five courses	1	2	1	5
Number of students carrying four courses	89	89	89	78
Number of students carrying three courses	8	2	8	11
Number of students carrying two courses	....	....	....	3
Aggregate number of courses	385	372	385	376
Number of course failures	13	21	5	15
Percentage of failure	3.4	5.6	1.3	4.0
	Grade X			
Number of students carrying five courses	9	7	5	9
Number of students carrying four courses	57	95	60	81
Number of students carrying three courses	3	5	3	17
Number of students carrying two courses	....	2	....	3
Average number of courses	282	434	274	426
Number of course failures	7	24	3	18
Percentage of failure	2.5	5.5	1.1	4.2
	Grade XI			
Number of students carrying five courses	5	15	10	13
Number of students carrying four courses	82	53	66	50
Number of students carrying three courses	14	17	27	21
Number of students carrying two courses	2	....	2	2
Aggregate number of courses	399	338	399	332
Number of course failures	4	2	2	1
Percentage of failure	1.0	0.6	0.5	0.3

in fact, less than the percentage which formerly obtained in the first-year classes in this school.

Note, third, that, while the percentage of failure is higher in the lowest years, it is a small figure, so small that we may reasonably conclude that it represents chiefly the normal adjustment friction.

Note, fourth, the response made by the seventh grade of 1921–22 to the greater pressure placed on it as described in the foregoing pages. While the percentage of failure for the first semester is nearly 50 per cent higher, gross, than in the preceding year, the two years are on a parity in the final comparison for the seventh year. More than that, in 1921–22 a materially greater proportion are carrying four courses, and there is a much smaller loss of aggregate courses carried as between the two semesters in 1921–22 than in 1920–21.

The facts seem to justify the conclusion that the transfer of the seventh grade to the High School has resulted in no detriment to the students over and above what always results in movement from the elementary school to the secondary school. Such being the case, we continue with some confidence the process of economizing time in the length of the school career.

Junior college work in the High School.—The University High School has enjoyed the opportunity, which the University of Chicago accords to all of its certificating schools, of issuing advance credit for superior work at the rate of two college majors for one high-school unit. This, of course, operates in the direction of economy for individuals in their full educational careers. Another form of economy is, however, being worked out, which operates institutionally rather than on individuals alone.

Partly through excess credit and partly through carrying more than the normal four units per year, a considerable proportion of the student body has been finishing the normal fifteen units in less than four years. For these students there was opened in the year 1918–19, largely under the influence of Dr. Lyman of the School of Education, courses in English 1 and English 40 of the regular University Freshman year. After a period of testing the product in the University, full University credit was given for these two majors. During the year 1921–22 a third major was added so that this course, which has become a regular scheduled part of the High-School program, covers three University majors, English 1, English 40, and English 41.

Similarly, for some years past the Mathematics Department has been building up experimentally at the eleventh-grade level a course in junior-college mathematics intended to cover the essentials commonly taught in the Freshman and Sophomore college years. Breslich's Junior College Mathematics was the result. The students taking this course have commonly been those with mathematical ability and some developed mathematical interest, though this has not invariably been the case.

At the beginning of the school year 1921–22, by agreement with the University Department of Mathematics, a small group of students entering the University with this course were allowed to begin their college mathematics at the senior-college level, that is, with the junior course in calculus. None of them received less than B for the college course. It was thus demonstrated, in certain desirable cases at least, that students can do without difficulty the essential Freshman and Sophomore college mathematics at the eleventh-grade level.

By arrangement with the University Department of History, the first three majors in history were opened to eleventh-grade students at the beginning of the year 1920–21, and this course has become popular. The results seem to promise equally well with those of the instances hitherto cited.

Finally, a fourth year of French at the eleventh-grade level receives due advance credit in the University over and above the regular advance credit for the three high-school units.

To recapitulate this section, regulation college department credit over and above fifteen entrance units may be earned in four different High-School departments in courses offered at the eleventh-grade level. At the end of the year 1920–21, of a graduating class of 103, thirty-six or 35 per cent completed one or more college courses of this kind. In the year 1921–22, of a graduating class of ninety, thirty-five or 39 per cent did similar college work.

Two aspects of the shortening situation are apparent. First, for students entering the High School from the Elementary School prior to 1920, an actual shortening of the elementary- and secondary-school course to eleven years has been accomplished; and the process of shortening to less than eleven years, or the equivalent enrichment of the curriculum, has been begun. Second, for students entering in 1920 and later, an actual shortening or its equivalent to ten years is an ultimate possibility.

Shortening the course not the only economy.—Economy may appear as truly in the enrichment of the curriculum as in the process of shortening. Students who have completed what amounts to three majors of college work, ten semester hours or thereabouts, before leaving an eleven-year school, or perhaps twelve to fifteen majors before leaving a twelve-year school, have undoubtedly made possible the completion of college work in three years or less. In many cases this may be highly desirable. It may be more desirable in other cases, especially if the student is still socially immature, to broaden general education instead of abbreviating the time spent. This kind of program is especially attractive when the student has also acquired a release from the obsession of mark-chasing and unit-accumulation. However, there seems to be a point of principle involved here which the writer thinks can be cleared up only through extended studies in maturity.

CONSTRUCTIVE STUDENT-ACCOUNTING IN THE SECONDARY SCHOOL

A. ADMINISTERING THE MALADJUSTED STUDENT

WILLIAM CLAUDE REAVIS
Principal, University High School

The problem of student-accounting.—In the administration of a modern secondary school, the most pressing of the vast complex of administrative problems is that of constructive student-accounting. This implies more than the bookkeeping involved in recording attendance and reporting school marks. It means that the school must undertake to account for its students with a degree of accuracy and thoroughness comparable to that attained by business organizations in accounting for their invested funds and the returns therefrom.

A detailed analysis of the causes affecting the progress of high-school pupils and the question of appropriate remedial instruction were matters of much less concern to administrative officers when the chief function of the secondary school was to prepare for college. As a matter of fact, a high rate of elimination was regarded as the most satisfactory evidence that the selective agency for the higher institutions of learning was performing its task successfully. But the rapid development of the public secondary schools in all sections of the United States during the last two decades and the attending modifications of aims in these institutions have brought to the foreground with the force of a demand the question of a more efficient accounting of pupil-progress.

High percentages of elimination and failure in secondary schools can no longer be defended or even condoned, if mutual confidence is to be maintained between administrative officers and supporting communities. In fact, a secondary school which permits 50 per cent of its pupils to fail has no better claim on public support than has the physician who loses one-half of his patients. The school cannot unload the responsibility for failure on the student alone as is often done. It must discharge its own grave responsibility as an institution by finding work that the pupil can do and through which he may develop such capacities as he has. Where now there is waste, there must come to be a full realization of the importance of the student-material and an unwillingness to make any sacrifice of this material.

The gravity of the present situation is shown in a study[1] of high-school failures in eight New York and New Jersey high schools where it was found that from one-third to one-half of the pupils enrolled failed in one or more subjects each semester up to the seventh. Indeed, even after the end of the second year when over half of the pupils had been eliminated from the schools, and only the selected pupils remained, failures continued to the number of one-third the total recorded. This story of waste is by no means confined to a single locality. Reports from many sections of the United States indicate that similar conditions prevail quite generally.

How is this problem to be met?—If the efficient business man were asked for his method of correcting this situation, he would reply, "Make a thorough readjustment." The school has not been inclined to accept or act on so drastic a formula of reorganization, preferring to regard itself as on the whole well organized and right in its administration and to look upon the pupil as responsible for all of the adjustments. It is evident that this attitude on the part of the school will never materially reduce waste. The school must provide for proper differentiation of courses and a flexible technique of treatment of individuals which will facilitate the adjustment of the students. This will require reorganization of the curriculum, improved technique of teaching, modern textbooks, more supplementary material, better construction of the program, better classification of pupils, a more valid scientific method of measuring results, and the collection and use of more exact data bearing on the personal history of the pupil, his physical condition, temperament, mental capacity, and habits of work. The administrative office must be constantly alert to discover causes of maladjustment wherever this occurs and must be prepared and equipped to advise remedial measures if such maladjustments are to be corrected. In this way only can a proper plan of student-accounting be worked out.

Administrative technique.—The scope of this paper precludes a full discussion of the administrative technique involved in dealing with all aspects of the problem of student-accounting. The present treatment will, therefore, be restricted to a study of a single type, namely, the maladjusted individual who is reported by the teacher to the administrative office for investigation and advice. Such a pupil is to be regarded as a problem case and is a challenge to the school to analyze his difficulties and to find remedial treatment. The different steps in the process of accounting for the problem cases will be described and will be illustrated by a case history of Student B.

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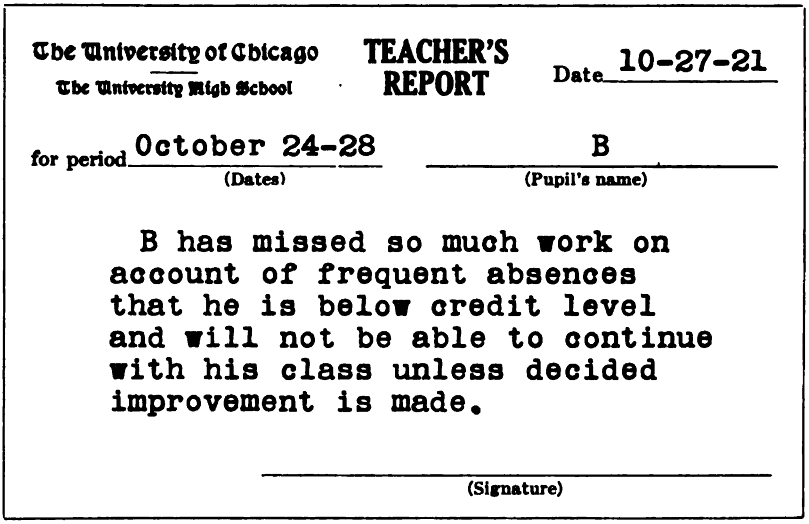
[1] Francis P. O'Brien, *The High School Failures*, p. 27. Teachers College Contributions to Education, No. 102. New York: Teachers College. Columbia University, 1919.

1. *Weekly reports.*—To the end that the problem cases may be taken up in their incipiency, the instructors in the University High School report to the administrative office on Thursday of each week all students whose work for the week has been of such character as to cause the instructor concern. The reports are descriptive in character and contain statements of fact rather than expressions of opinion.

FORM OF WEEKLY REPORT



The University of Chicago
The University High School

TEACHER'S REPORT

Date 10-27-21

for period October 24-28
(Dates)

B
(Pupil's name)

B has missed so much work on account of frequent absences that he is below credit level and will not be able to continue with his class unless decided improvement is made.

(Signature)

In many of the cases of unsatisfactory progress reported in this way, a single report to the parents or a timely warning from the administrative office is sufficient to bring about the change desired on the part of the student. Such cases are not regarded as failures, but rather as cases exhibiting incipient tendencies which must be checked promptly and corrected if the students are to receive full value from the training afforded by the school and if ultimate failure is to be avoided. In other cases where a student's name turns up again and again in the weekly reports, both instructors and administrative officers recognize the case as one calling for closer attention and investigation. The total number of students reported at different times between October 3, 1921, and

February 3, 1922, by the different departments of the University High School is shown in Table I.

TABLE I

SUMMARY BY DEPARTMENTS OF PUPILS REPORTED FOR UNSATISFACTORY PROGRESS, OCTOBER 3, 1921, TO FEBRUARY 3, 1922

Department	Number of Boys	Number of Girls	Total
English	61	18	79
Mathematics	39	19	58
Social science	24	6	30
French	71	63	134
Spanish	7	0	7
Latin	59	42	101
German	0	0	0
Science	46	37	83
Shop	18	0	18
Art	6	20	26
Household arts	0	47	47
Physical education	0	0	0
Music	0	0	0
Library	10	0	10
Total	341	252	593

2. *Mid-semester reports on problem cases.*—In addition to the weekly reports there is at the middle of each semester a complete checking up of each pupil who is regarded as a problem case. The instructor submits a detailed report of his findings regarding the student to date, and the administrative officers assemble a review of the weekly reports received during the period, the attendance record, the student's personal health history, the results of his medical examination, a statement of the study habits exhibited in connection with the student's voluntary work in the study hall, and the results of the mentality test and the Downey Individual Will-Temperament Test. These data are carefully studied by the principal in the case of the boys and by the assistant principal in the case of the girls. The conclusions are either transmitted to the parents by letter, or the parents are invited to come to the school for a conference with the administrative officers and teachers in order that the best possible diagnosis of the pupil may be made and the proper remedial treatment determined.

An example of the full technique employed follows:

a) *Instructor's mid-semester statement.*—The following statement is one of four mid-semester reports sent in regarding Student B, a member of the Freshman class, who came to the school at the beginning of the term, October 3, 1921.

November 23, 1921

B is not making satisfactory progress in ____________. He is a capable student, but his attendance has been so irregular that he has missed large sections of the work. When present he struggles along with his attention divided between back work which he is trying to make up and work on which the rest of the class is engaged. Unless he can attend more regularly, it will be necessary for him to repeat this course.

____
Instructor

b) *Review of weekly reports.*—A review of all of the weekly reports showed that Student B had been reported several times for unsatisfactory progress and that the cause each time seemed to be absence. These reports had been mailed to the parent, but no response had been received. Telephone calls from the office to the home regarding the pupil's absence had resulted in no satisfactory explanation. The mother was usually out, and the housemaid stated that the boy was ill and would soon return to school.

c) *Attendance record.*—B's attendance record showed seventeen days of absence out of a possible forty days. The absence was distributed as follows: two periods of five days each, one period of four days, and three periods of one day each.

d) *Personal health history.*—The personal health history of B, secured by the medical examiner from the parent at the time of admission to the school, follows. It may be remarked that such information is of great value in administration.

October 3, 1921

STUDENT B

1. Birth-date: Year, 1904; month, 8; day, 6.
2. Age of father, 49, mother, 36, at time of student's birth.
3. Name diseases to which near relatives have been subject:
   Father died of pernicious anaemia.
4. Give general health of father: poor.
   Mother: good.
5. Check any of the following diseases suffered.
   If more than one attack, check twice.
   Chickenpox
   Diphtheria
   German measles
   Influenza
   × Measles
   × Mumps
   Poliomyelitis
   Pneumonia
   × Scarlet fever
   Smallpox
   Tuberculosis
   × Typhoid fever (1916)
   × Whooping cough
6. Name other serious illnesses: none.
7. Name operations: tonsils and adenoids.

8. Do any permanent effects of such illnesses or operations persist?
Yes. Frequent indigestion.
9. Is there a tendency toward colds? Yes.
10. Has injury ever been received in gymnastics or athletics?
Yes. Back.
11. Has the rate of growth been normal? Yes.
12. State cause of abnormal growth.

Signature of Parent

e) ***Medical examination.***—In addition to the statement made by the parent, the school physician makes, at the opening of each school year in October, a complete medical and dental examination of each student, and the record is filed. This record is used for various purposes. The parents of students who are in need of medical or dental attention are notified of the findings of the examiner, and a record is made when the recommendation is complied with. Within the school itself the record of the medical examination is used to direct all kinds of remedial work. Especially in such a problem case as that under discussion is the material useful for educational diagnosis.

The medical record of Student B showed that on September 30, 1921, he was 17.2 years old; weight, 105.5 pounds; height, 66 inches; girth of chest expanded, 32.4 inches, normal, 30 inches, and after exhaling, 29 inches; lung capacity, 3.9 liters; (lungs: percussion, O.K.; ausculation, bronchial vesicular breathing over right apex; general condition otherwise good); girth of waist, 24 inches; arm span, 68.6 inches; vision right and left with glasses, 20/25; hearing, O.K.; nose, O.K.; circumcised; pubescent signs present; heart, O.K.; two teeth decayed and one protrusion.

The foregoing report of the medical examiner shows Student B to be physically sound with the exception of a condition of marked underweight for age and height. The personal health record indicates a low vitality and a tendency to frequent indisposition which would probably result in irregular attendance at school.

f) ***Study-hall supervision.***—In order that the habits of work of the student under examination might be ascertained the following special request for a report was sent to the director of the study hall.

November 23, 1921

B has been reported to the office for unsatisfactory work in all subjects during the past seven weeks. Please record any observations you have made in your study of, or relations with, this pupil that might assist in determining the contributing causes or prescribing remedial measures.

Principal

The following report was received:

> B has been absent from the study hall for long periods at a time. He lacks physical vigor and does not concentrate well in study. He seems discouraged, indifferent, and lacking in interest. His habits of study are at present poor. I have discussed the matter with him and he seems to grasp the situation fully. I believe he is capable and would soon show improvement if he could attend more regularly.
>
> ______________________
>
> Director of Study Hall

g) *Mentality test.*—Early each year a standard mentality test is given to all of the students in the school. The results are recorded, and any unusual variations from previous tests are noted. The different tests are analyzed for all problem cases to ascertain wherein the individual is strong or deficient.

TABLE II

RESULTS OF TERMAN GROUP TEST OF MENTAL ABILITY—STUDENT B

Test	Score	Possible Score	Percentage
1. Information	17	20	.85
2. Best answer	22	22	1.00
3. Word meaning	28	30	.93
4. Logical selection	11	20	.55
5. Arithmetic	12	24	.50
6. Sentence meaning	14	24	.58
7. Analogies	18	20	.90
8. Mixed sentences	16	18	.89
9. Classification	16	18	.89
10. Number series	16	24	.66
Point score	170	220	....
Mental age	17.7	....	....
Intelligence quotient	110	....	....

The test record of Student B is given in Table II. It should be noted that he is strong on information and in the tests measuring facility in English and weak in logical selection, sentence meaning, arithmetical reasoning, and number series.

h) *Will-temperament test.*—The Downey Individual Will-Temperament Test was given to about 25 per cent of the students enrolled in the University High School, including the chief problem cases. The profile of Student B is given in Figure 1.

The interpretation of the results of this test indicates that Student B is of the aggressive type. His profile shows indications of variability. Although definitely aggressive and deficient in patience (self-control in tedium), he can on occasion exhibit co-ordinated and throughgoing effort. He is ordinarily rather slow, works much below his best, and adapts himself to new situations fairly slowly. His outstanding traits are those which indicate the aggressive nature; he reacts positively and with energy to contradiction and to a blocking of his purpose. He has a high degree of inherent energy (motor impulsion) which is apt to come to the fore when anything blocks his usual slow progress.

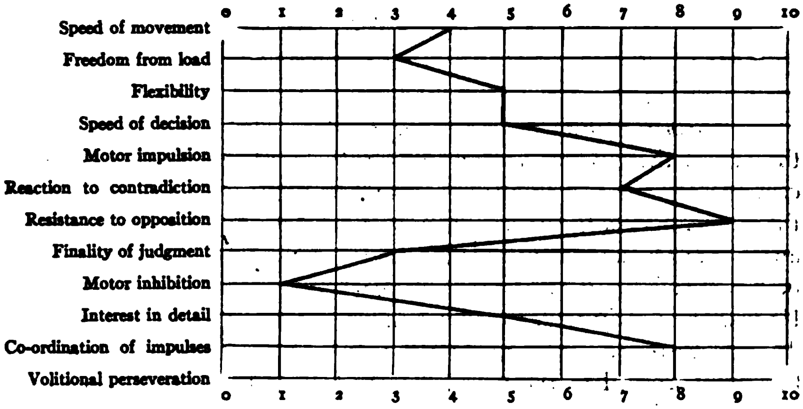


FIG. 1.—Student B's will-temperament profile

i) *Summary of case at mid-semester.*—The information at hand regarding Student B may be summarized as follows: (1) He is below credit level in all of his courses. (2) He has attended only half-time. (3) His absence is probably caused by poor physical condition. This has not been fully verified. (4) No co-operation from the home has been secured. (5) Study habits are not good. (6) Mental test shows good intelligence with weakness in logical reasoning. (7) The Downey Individual Will-Temperament Test indicates potential characteristics of a good student.

j) *Letter to the parent.*—After the data on a problem case have been carefully studied by the administrative officer, a communication is sent to the parent. In the case of Student B, the message was as follows:

November 26, 1921

MY DEAR MRS. ———:

Your son, B, who entered our school in October, has been reported to me for unsatisfactory progress in all of his courses. I believe this is largely due to irregular attendance. Previous reports to this effect have been mailed to you, and we have tried to reach you by telephone without success.

It should be evident to you that your co-operation is necessary if the school is to accomplish anything for B. Will you, therefore, please call at my office some time before next Friday to discuss this matter with me.

Very truly yours,

———————

Principal

k) *Further information.*—On the morning following the receipt of this letter, the mother of Student B called at the principal's office for conference. She is a business woman and is usually away from home the greater part of the day. She was greatly interested in B but was not aware that he had missed so much school. It seemed that B had never been physically strong. He was anaemic and suffered from indigestion. He was frequently under the care of a physician who prescribed both diet and exercise. B was really in better condition than he thought. If he felt indisposed in the morning after his mother left the house, he remained at home instead of going to school. As a matter of fact, he might have been at school the greater part of the time he was absent. He had become discouraged over his physical condition, and frequent absence had resulted in loss of interest in school.

As a result of the conference it was agreed that B should come to school daily unless extreme illness prevented. In that case a message was to be sent to the principal's office by telephone. He was to do his best to keep up with his class and to make up the work lost by absence as rapidly as he could without overtaxing his strength. He was to follow a daily program consistently and on failure to do so was to notify the principal promptly.

3. *Semester report.*—The further history of the problem case is shown by the semester report. It may be said by way of introduction to the presentation of this report that such a semester report is required for all pupils enrolled in the school during the semester for the purpose of having a credit record of each pupil in the different courses undertaken. Directions to the teachers who are to prepare these reports are as follows:

1. The report should contain the names of all pupils who have been enrolled in your classes during the semester.

2. A check mark should be placed in one of the columns to the right of the pupil's name on Form 1 to certify the attainment of the pupil.

3. Column 3 should be checked for all members of your classes at the end of the semester whose work is at that time *incomplete*. In mathematics, science, history, content courses in home economics, courses in mechanic arts, and content courses in general, this will apply to the completion of the units or blocks which the class has completed. In English composition, French, Latin, Spanish, and German, it will mean that a student is not gaining power aimed at, at the end of the course. If you believe that a pupil so marked in spite of his present incompleteness has a reasonable chance of making up the work and continuing with his class, indicate in Column 5 your willingness to have him remain in the class.

4. It may be that the work of some pupils in spite of our policy to "teach, test, and teach again" has been so poorly done that they cannot profitably continue the course with their class. For such pupils a readjustment in classes may offer prospects of better results. Check Column 1 and indicate your recommendation in Column 5.

5. It is possible that you may have a few extreme problem cases who have apparently not profited to any appreciable degree from your instruction. We should place them where they can be studied most profitably. They should be studied by administrative officers, heads of departments, physician, and study-hall teacher, as well as by instructor, with the hope that a diagnosis may be made that will lead to remedial treatment. Check Column 1 and indicate in Column 5 "extreme problem case."

6. Pupils who have mastered the minimal essentials prescribed for the course for the first semester should receive credit at that level. Check Column 2. Note, however, that in English composition, French, Spanish, Latin, and German, mastery prior to the end of the course means that the student is gaining the power aimed at at such a rate that the teacher believes he will have the desired power at the end of the course. In these courses minimal essentials do not apply to ground covered.

7. Pupils who have completed excess-credit projects should be checked in Column 3 or Column 4 in accordance with the character of their excess work.

8. Most courses in language-arts subjects have or should have a somewhat definite objective which can be stated in terms of power to write or to read. If any pupils have already attained the power that is expected of students at the end of the course, please indicate it in Column 5.

9. Pupils who have been enrolled in your class during the semester but who have discontinued membership should be marked in Column 5 "dropped" and reason stated as "left school," "transferred to another class," or "could not do the work."

10. A special report on Form 2 should also be made of each case reported below credit level. It is not sufficient in such cases merely to state this fact. The report should contain a brief but comprehensive statement of your knowl-

edge of the pupil, the reasons for his unsatisfactory work as you understand them, and your recommendation to the office for administrative investigation. This report should be discussed with the head of the department before it is sent to the office.

FORM 1

Report of Science 1 (course) for 17 weeks ending February 3, 1922. The check marks below indicate the level at which the work has been carried.

Instructor

Names (alphabetically)	Below Credit Level (1)	Mastery Level			Remarks or Recommendations (5)
		Unit Credit (2)	.1 Unit Excess (3)	.2 Unit Excess (4)	
1. Case B..........	×	....	....	....	To continue
2. Case C..........	×	....	....	....	Readjust
3. Case D..........	×	....	....	....	Extreme problem
4. Case E..........	....	×	....	....	Does essentials only
5. Case F..........	....	....	×	....	Fine intellectual interest
6. Case G..........	....	....	....	×	Independent student
7. Case H..........	....	....	....	....	Left school

FORM 2

SEMESTER REPORT OF WORK BELOW CREDIT LEVEL

Name of student: B Date: February 3, 1922

Subject: Latin 1 Teacher____________________

(In the space below please give a brief but comprehensive statement of your knowledge of the pupil, causes of his failure, and recommendations for administrative investigation.)

STATEMENT

B is below credit level in Latin 1. He is a capable student, but language seems to be difficult for him. The work missed during the early weeks of the term has greatly handicapped him; although he is putting forth fine effort and is now attending more regularly, his chance of completing the course satisfactorily is slight. I recommend that he be allowed to continue the course and to get what he can. If he expects to go on with Latin, it will probably be necessary for him to repeat Latin 1 next year.

Summary at the end of first semester.—Table III gives a summary by departments of all students who were below credit level at the end of the semester, February 3, 1922. At least half of these were expected to be able to bring their work up to credit level before the close of the year.

TABLE III

Departments with Number and Percentage of Students below Credit Level at End of the Semester, February 3, 1922

Subject	Number of Students	Number of Students below Credit Level	Percentage of Students below Credit Level
Art	30	5	16.7
English	442	11	2.5
French	282	47	16.7
German	13	0	0.0
Household arts	76	4	5.3
Latin	200	13	6.5
Mathematics	347	9	2.6
Mechanical arts	105	11	10.5
Music	303	18	5.9
Physical education	290	2	0.7
Science	290	20	6.9
Social science	166	10	6.0
Spanish	33	5	15.2
Total	2,577	155	6.0

TABLE IV

Problem Cases at Middle of the Second Semester, March 25, 1922

Name of Student	Year	Subject in Which Student Is Below	Cause	Treatment
Case B...	I	Latin 1	Physical	Anaemia and indigestion have caused B to miss the early part of the term. Now under care of physician and is attending school regularly. He will be able to make up all back work except Latin. To continue Latin and do the best he can.*
Case C...	IV	Mathematics Chemistry	Volitional	Given two weeks to bring up back work or drop chemistry. This would prevent his graduation. There is no question about his ability to do this if he so desires.
Case D...	I	French	Psycho-physical	Poor written work unavoidable on account of inability to write either legibly or rapidly. To be measured more by oral work.
Case E...	III	Physics	Emotional	Student has normal ability. Has developed a failure complex.† Must be given some work at which he can succeed. Can spend another year in physics if necessary.

---

* B has made up all back work and is carrying English, science, and mathematics at mastery level at date of report.

† By failure complex is meant a conscious tendency to establish associations between learning situations and disastrous past experience.

4. *Classification.*—As the study of the problem cases is continued the second semester the number steadily decreases as adjustments are effected between individuals and the school. In this connection it is interesting to note that the correct diagnosis of a case invariably results in a more or less perfect identification with some type. The types most frequently found are as follows:

a) *Volitional.*—This means that the pupil can work but will not. It covers such factors as indolence, insubordination, and lack of power to concentrate on uninteresting material.

TABLE V

CLASSIFICATION OF PROBLEM CASES AND THEIR STATUS AT THE MIDDLE OF THE SECOND SEMESTER, MARCH 25, 1922

	Number of Cases
Problem cases:	
Intellectual	20
Volitional	22
Psycho-physical	4
Mental	2
Physical	14
Emotional	2
Unclassified	13
Total	77
Satisfactory adjustment made	43
Improvement noted	24
No change noted	9
Withdrawn from school	1

b) *Intellectual.*—This signifies that the trouble is believed to result from a lack of knowledge and training requisite for mastery in the subject or subjects involved.

c) *Physical.*—In general, this term refers to bad health and physical defects. The most common cases will be malnutrition, tonsillar troubles, troubles of the naso-pharynx, genito-urinary organs, bad teeth, etc.

d) *Psycho-physical.*—This term is intended to cover defective sense organs, inco-ordination, and, in general, defects of the central nervous system and its end organs which interfere with good school work.

e) *Mental.*—This term includes only actually deficient mentality as revealed by intelligence tests and corroborated by other factual evidence.

f) *Emotional.*—This term refers to students who appear to be controlled unduly by attitudes detrimental to the successful accomplishment of regular school work.

g) *Unclassified.*—No rough classification is possible.

Conclusion.—The problem of student-accounting in its last analysis is a measure of administrative efficiency. The blame for waste through maladjustment cannot be placed solely on students or on teachers, but in a large measure on the system that fails to provide for the individual student-problems it is called on to treat. This is the responsibility of the administrative officers, and they ought to be prepared to develop an institutional system based on the theory that the school has an instructional duty to every pupil and that a high percentage of failure is as much a reproach in a school as in any other enterprise. While it is hardly possible that pupil-waste in our secondary schools can ever be reduced to the vanishing-point, this fact affords a poor alibi for the absence of a definite, well-formulated administrative technique designed to give at least a per capita accounting however rough.

CONSTRUCTIVE STUDENT-ACCOUNTING IN THE SECONDARY SCHOOL—*Continued*

B. THE CASE-HISTORY METHOD APPLIED TO THE ADMINISTRATION OF HIGH-SCHOOL GIRLS

ELSIE M. SMITHIES
Assistant Principal, University High School

The problem of the dean of high-school girls.—If one were to form an opinion of the administrative duties of a dean of high-school girls from the frequency of the topics discussed at educational conventions where such matters are considered, one would conclude that the chief function of this new administrative officer in the field of secondary education is to serve as the secretary of a social bureau of the school. While the social problems of the high school are important and should necessarily be a matter of great concern to the dean of girls, this officer has a much larger responsibility to the school in adjusting the personal problems of the individual girl. Accordingly, the real constructive work of the dean should lie in the field of individual study; and it is the purpose of this section of the monograph to indicate and illustrate the method by which this may be accomplished.

The method explained.—A diagnostician dealing with a physical ill does not treat a roomful at once and no longer merely feels the pulse, looks at the tongue, and pronounces a decision, but studies the individual's history from every possible angle. In the same way a dean of girls should not attempt to treat a dozen girls as one problem and prescribe the same treatment for all. It is not fair to a student to look at the grades on a report card and pronounce the verdict, "She is stupid, mentally below par. It is not a case for me." The administrative diagnostician must study her physical, mental, and moral history.

The method outlined in the following pages is still in the experimental stage, and there is no claim whatsoever that the panacea for mental ills or social maladjustments has been found. To prove that permanent results have been effected will take a study of several years. It should, however, be emphatically stated that in the University High School no method has secured finer co-operation on the part of both parent and student, nor has any other method offered as helpful suggestions to faculty members who are daily dealing with girls in their classrooms.

Furthermore, the problem-student has ceased to be annoying and irritating and has become most interesting, stimulating, and provocative to investigation.

Before proceeding with the outline the fact should be emphasized that no girl knows that she is being studied as a problem. This would defeat the study. The material in every case has been secured through the most natural, unrestrained, and friendly conversation. To secure the family history and early life of the student it has been necessary to be more confidential about the case with the parents. Of course, the answers to some of these questions must be obtained indirectly and with consummate tact. There are times when answers to some questions cannot be gained, and seldom is the history completed at one or even two conferences.

I. Family
  1. Father
    a) History of father's family
      (1) Any unusually tall members?
      (2) Any unusually small members?
      (3) Twins? More multiple births?
      (4) Birth deformities?
      (5) Any cancer, goiter, or tuberculosis for three generations of blood relatives?
      (6) Any member who was a hard drinker?
    b) Personal
      (1) Father's present age?
      (2) Any physical deformity?
      (3) Height as youth? Any period of rapid growth?
      (4) Weight when born? Age of greatest weight? Was weight gained or lost rapidly at any age period? When?
      (5) Age of father's parents when he was born? Previous and subsequent children? Age interval separating children?
      (6) Age of father at ———'s birth? Previous children? Age interval? Subsequent children and age interval?
      (7) Blond? Brunette? Medium? Albinism?
      (8) Present business? Business at time of the birth of the child? Has father at any time worked in contact with lead, brass, copper, zinc, dyes, arsenic, paints, silk or cotton manufacture, silk fumes, particularly volatile oil derivatives?
      (9) Education: Grammar school? High school? College? Advanced?

2. Mother
    - *a*) History of mother's family
        - (1) Any unusually tall members?
        - (2) Any unusually small members?
        - (3) Twins? More multiple births?
        - (4) Birth deformities?
        - (5) Any cancer, goiter, or tuberculosis for three generations of blood relatives?
        - (6) Any member who was a hard drinker?
    - *b*) Personal
        - (1) Mother's present age?
        - (2) Any physical deformity?
        - (3) Height as a youth? Any period of rapid growth?
        - (4) Weight when born? Age of greatest weight? Was weight gained or lost rapidly at any age period? When?
        - (5) Age of mother's parents when she was born? Previous and subsequent children? Age interval separating children?
        - (6) Age of mother when married? Age of mother at birth of first child?
        - (7) Health of mother at the birth of ———? Present health of mother? Birth number of ———?
        - (8) Blonde? Brunette? Medium? Albinism?
        - (9) Did mother work before marriage? What business?
        - (10) Did mother work after marriage?
        - (11) Education: Grammar school? High school? College? Advanced?

II. Student's physical history
- 1. Important facts which ought to be known
    - *a*) Birth of the child
    - *b*) Early childhood
    - *c*) Does ——— favor the father's or mother's side?
    - *d*) Present condition
        - (1) Defects: Hearing? Seeing? Breathing?
        - (2) Any permanent effects of illnesses or operations? What severe illnesses? What operations?
        - (3) Any tendency toward colds? Nervousness? Sore throat? Indigestion? Persistent constipation?
        - (4) Any marked physical weakness?
        - (5) Result of metabolism test
    - *e*) General manner of living
        - (1) Meals
        - (2) Sleep
        - (3) Exercise

III. Education previous to entering University High School
  1. Name of school
    a) Type
    b) Equipment
  2. Record of scholarship in previous school attended
    a) Any marked defects?
    b) Ability?
    c) Recommendation from school?
IV. School life
  1. Scholastic record
    a) Difficulties
    b) Success
    c) Adjustments
    d) Results of mental tests
  2. Social record
    a) Participation in school activities, e.g., clubs, dances, etc.
    b) Number, age, and type of friends
  3. Athletic record
    a) Participation
    b) Honors
V. Life outside of school
  1. Manner of living during the school year
    a) House
    b) Apartment
    c) Hotel
  2. Social diversions
    a) Type
    b) Frequency
  3. Vacation period
    a) Where spent?
    b) How spent?
VI. Traits displayed at home and at school
  1. Cheery or ill-tempered and peevish?
  2. Patient or irritable?
  3. Friendly or reserved?
  4. Cordial or indifferent?
  5. Sociable or unsociable?
  6. Talkative or taciturn?
  7. Courteous or discourteous?
  8. Well-spoken or gossipy?
  9. Modest or vain?
  10. Open to suggestion or opinionated?
  11. Possessed of common sense or lacking in judgment?

12. Willing to lead or inclined to follow?
13. Keenly alive or apathetic?
14. Democratic or snobbish?
15. Self-poised or flighty?
16. Calm or nervous and excitable?
17. Contented or dissatisfied?
18. Optimistic or pessimistic?
19. Frank and candid or underhanded?
20. Emotional and moody or phlegmatic?
21. Prompt or dilatory?
22. Industrious or idle?
23. Steady or intermittent?
24. Trustful or jealous?
25. Co-operative or combative?
26. Honest or dishonest?
27. Reliable or unreliable?
28. Reasonable or unreasonable?

A word of explanation is necessary about the questions asked concerning the family history of the father and mother. Each question asked bears directly on inherited physical defects which might affect the vitality of an offspring. It is imperative to know if the child has started with a physical, moral, or mental handicap. The questions on the personal history of the subject are self-explanatory.

CASE HISTORY OF FLORENCE X

The following account in detail will show the procedure and the results of the study of the case of Florence X. This girl was seventeen years old and had been a member of the school for three years when she came into the office of the dean of girls one day near the end of the semester with the request that her report card be kept in the office for a week as she had failed in one subject and did not want the failure to go home because her family would call her "Dummy" again. At the time of the interview her hands were cold and clammy, her eyes wide open, and her face flushed. She was on the verge of tears and was tense in every muscle. She was assured that the report would not go home, and after fifteen minutes of general conversation she left the office apparently happy and quiet.

Scholastic record.—A study of her history was immediately begun. She had come from a city grade school at the age of fifteen with a fair recommendation and no specific weaknesses stated. Her first year in the University High School had almost proved fatal. At the end of one month it was necessary for her to drop French, one of her four subjects.

During the first semester she successfully completed English, mathematics, and drawing and design. Her second semester was more discouraging, a failure in mathematics and a condition in drawing. During the summer she studied French and was at the passing level. Her second year started with French 2, English 2, repetition of Mathematics 1, and general science (a Freshman course). Within a few weeks it was advisable for her to drop French and devote her energy to three subjects. At the beginning of her third year she was permitted to try four subjects because it was felt that the adjustment to new conditions had probably been made and especially because she was so eager for the chance to try. It was the failure in one of the four subjects which led to the study of her case.

Family history.—The history of her mother and father revealed nothing extraordinary. Both are well educated and have taken a serious and sensible view of Florence from babyhood. The father was forty-three at the birth of Florence while the mother was twenty-four. The same disparity of years was found common on the father's side. The difference is not so great as to cause any mental weakness, but it is a push on the wrong side. The mother is an exceedingly nervous person, inclined to weep when she talks of Florence. There are three younger children, a girl and twin boys. Mrs. X's nervousness had grown worse during the early years of Florence's life by reason of several severe shocks. For example, one night when alone the mother was forced at the point of a revolver to open a safe for burglars. Florence was a witness of this scene, and it no doubt made a lasting impression.

Childhood.—During early childhood and early adolescence Florence had several severe attacks of tonsillitis and muscular rheumatism. A hard case of diphtheria followed by measles left her weak and with a cardiac murmur. No doubt, these physical handicaps put the child out of step with her playmates at the start and at the same time caused mental distress as to whether she could keep up with them.

Present mode of living.—At present, however, she looks well and strong. Her manner of living is wholesome and simple. Her meals are regular and adequate, and she sleeps more than nine hours each day. Her amusements and entertainments are confined to the week-ends and are of a most simple nature, small parties with girl friends, an occasional visit to the theater, and normal church duties.

Her exercise is taken quite systematically—gymnasium work at school, a good walk to and from school, tennis, etc. She is not an athlete but enjoys games and sports.

Her social activites in the school are confined to the drama club where she is a spectator rather than a participant. As yet, her friendships are almost entirely among girls of fourteen or fifteen years of age who are in her classes. The following adjectives were used by faculty members and her mother in describing her: cheerful, patient, friendly, social, courteous, modest, open to suggestion, apathetic, inclined to follow, democratic, exceedingly nervous and excitable, frank, emotional, intermittent in effort, honest, reliable, and reasonable.

Mental test.—With conditions as favorable as in this case, one might expect Florence to progress as any normal girl. But she continuously failed in one or more subjects. The intelligence tests were given, and the results were discouraging: Terman Group Test—I.Q., 91; normal, 100; mental age, 14-7; Chicago test—32; median, 55; Otis test—116; median, 151. The Downey Individual Will-Temperament Test was the only one which gave any encouragement. The results are shown in Figure 2. The interpretation by the examiner is as follows: "Works

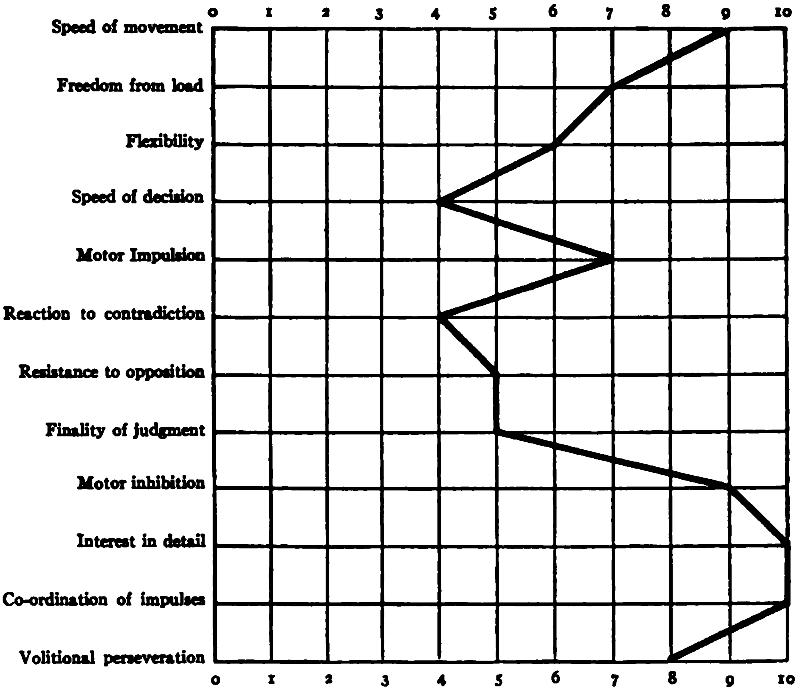


FIG. 2

at relatively high speed and is at times capable of interested, careful, and sustained effort. Outwardly flighty and decidedly quick, yet there are other traits which serve to control these impulsive tendencies and enable her to put forth careful controlled effort." This report was at variance with everything known about her but encouraged further study.

The real cause of failure.—After the excited outburst about the report card to which reference has been made, the metabolism test was given and she was found to be +20 per cent. Her whole organism was apparently overworking and consuming too much energy. It was suggested that she ought to drop one subject. During the conference she was asked, "Why can't you pass certain quizzes in home economics?" The most illuminating explanation was given. Her remark was, "If I ever fail a test, I can never pass *that* test, never, never." To the question, "Why?" quickly came the response, "Because the first failure is always before me." So this was the story, a fear complex causing an exaggerated inhibition. In conferences since that time the following facts have been revealed. In any written work, if Florence reads, for example, five questions which she can answer easily and comes upon a sixth question which she cannot answer, thereupon such mental panic ensues that when she reads over those which she could have answered perfectly a few minutes before she cannot think of the answers for any.

It is the same in physical work. During her Freshman year she did rather well in the high jump. Once, however, on landing she twisted her ankle. Recently she tried the high jump with the bar inches below her former achievement, and she not only was not able to go over but could not even make the attempt. Her explanation was that her knees would not come up because she felt the pain in her ankle. Up to this time she had felt no pain in her ankle since the fall a year before.

One day she was asked if she could remember when this pronounced and almost paralyzing fear started. It seems that at the age of thirteen she was associating with several older girls who were attending high school and were studying physiology. They very vividly described to her that each person has a little tongue in the throat which often swells up at night when the person sleeps and chokes him to death. This little tongue also works disastrously while chewing meat. The reaction from this fear was so great that Florence could not sleep well at night for weeks. She grew thin and weak, but no mention of it was made to her parents. Forced by her parents to take meat, she chewed it and then surreptitiously concealed it on a ledge under the table. Every day she secretly cleaned off the ledge. It was only by accident that one day the maid discovered the food and told Florence's mother. This, of course, called forth an explanation and the parents then had an even chance to cope with the fear.

Analysis and tentative objectives.—It is known that the student has a distinctly unbalanced emotional structure which can be traced with some degree of confidence back to childhood. She has a fear complex closely related to anything she attempts to do. In common parlance she is greatly lacking in confidence. There is some suggestion of nutritional disorder. This aspect is, of course, a matter for the medical specialist.

An intelligent program can be made up in the following terms: (1) Restoration of confidence and release from the exactions of formal administrative school routine. Conversation with the parents regarding the "dummy" episode. (2) A light school program, plenty of rest, and avoidance of the distractions of city life. (3) A wholesome dietary régime. (4) In due time contact with a medical specialist.

Remedial suggestions.—After several conferences Florence was convinced that she should take only three subjects, not because she was *stupid* and could not carry four, but because she needed to rest in the middle of the day. With her consent arrangements have been made so that she drinks a pint of milk each day at eleven o'clock and then sleeps for half an hour.

The thought is constantly kept before her that she is just as bright as other people, that she must not acknowledge inferiority nor must she ever suggest failure to herself, that in all tests she must handle but one question at a time, and that when she meets a physical obstacle she must force herself to overcome it.

For the summer it was recommended that she live in the open with girls of her own age so that she might be relieved from any nervous associations at home, that she might see *natural* normal reactions of healthy girls, and that she might be away from the stress and strain of the city with an opportunity to build up her whole system by a carefree life in the open air.

Already she herself feels an improvement in health and has said, "I feel so much better because I am not afraid and I am not worrying."

CASE HISTORY OF GERTRUDE Y

The case of Gertrude Y came up because of the marked contrast between the record of the eighth grade and the record being made in the University High School. Gertrude had come to this school recommended far beyond any of her classmates. She had had difficulty in no subject, was superior (rank E+) in mathematics, and showed prospects of becoming one of the best pupils.

At the opening of the school in October it was noticed that she had grown during the summer from a very little girl to a young lady. The first week or two she seemed to be adjusting herself to high-school conditions without any difficulty, but within two months she was like a ship without a rudder. All of her teachers reported that there was diffusion of attention, no concentration, and poor attack. Gertrude was questioned, and from all appearances she was eager to do well and was very much ashamed of her record. During the first semester she failed in mathematics, which had been her best subject in the elementary school; her French was carried with difficulty; science and English were only fairly satisfactory. During the second semester an art course was started because Gertrude felt that she was more interested in art than in any other subject. The school year was passing on, and she was failing in most of her work.

Physical history and home life.—Her physical record card showed that she had a slight heart murmur which kept her from too strenuous exercise but apparently affected her general health very little. She was well cared for at home by parents who were well, strong, and sensible. The family histories of both were unusually good. The father and mother were about forty-three years old, and most of Gertrude's recreation was taken at that time in the company of her parents and older people. After several conferences with her mother I felt as if I had run into a blank wall, for the only conclusion I could reach each time was that Gertrude was eager to do well but evidently could not. The whole case was as puzzling to her mother as to me. During my last conference Mrs. Y casually remarked, "I will wait for Gertrude because it is necessary that I take her home to her cousin immediately after school. She depends upon Gertrude so much." Woman's curiosity prompted me to ask if the cousin were younger or older. This story followed. The cousin (Mrs. P) and her husband had lived in the apartment below and had considered Gertrude almost one of the family. The husband died suddenly, and Mrs. P was left alone. In her grief she had turned to Gertrude and had wanted her with her constantly. Even at night Mrs. P asked Gertrude to stay with her and constantly poured out her grief. Many times, even though Gertrude stayed at home, she would be kept awake with the sobbing and crying in the apartment below. The mother admitted that Gertrude herself was getting depressed and morbid about the whole affair and seemed to be able to talk of little else. I said little at the time but a week later I called in the mother for conference and explained carefully that I thought that the grief of Mrs. P was no doubt a big factor in Gertrude's failure in school. This morbidity and depression had come at a very impressionable age. It could easily account for the diffusion of attention and the weak attack on her class work.

Remedial suggestions.—I recommended or rather insisted that Gertrude be kept away from Mrs. P, that her room be changed so that her sleep would not be disturbed, that she be urged to seek young companionship, and that her summer be spent in the open, away from all association with the scene of the sorrow. The mother was eager to co-operate and did everything suggested.

Results.—The change was almost immediate and was most gratifying. It was too late, true enough, to save her school subjects, but it helped the girl to get her bearings.

At the beginning of her second year she returned in excellent health and in fine spirits.

All year she carried four subjects, English, French, mathematics, and art and has gained .1 excess credit in each of her subjects. From no teacher have I had anything except the highest commendation for Gertrude's attention and attainment.

CASE HISTORY OF SADIE Q

In 1921 Sadie Q was an immature little girl of thirteen who had the tears so near the surface most of the time that one hesitated to make any corrections. She had a baby face with an old look as if the cares of the world were heavy upon her. One day Sadie was tardy and appeared in the office for a re-admission slip to her class. Breathless, weeping, and inarticulate, she was the picture of despair. Her face, hands, and neck were dirty, her hair stringy, and her dress covered with spots. After I had calmed her sufficiently to understand what she was saying, I learned that in her haste she had taken the wrong car and had gone in the wrong direction. I asked if her mother had seen her before she left for school and knew she had so many spots on her dress. She said, "No, Father has a store and Mother has to help him even at night, so they both have to sleep late in the morning, and I only go in to see Mother to say 'good-bye.'" After a little washing and sponging she went happily on her way. Her answer to my question had set me thinking. A very little girl who rode five miles to school on a street car early in the morning and started out after getting her own breakfast, with no more attention than a rather hasty "good-bye" from her mother, surely needed some help. Just about this time Sadie's teachers began to report a little weakness in mathematics and French. It was not very serious but called for co-operation from the home, so this gave me an opportunity for a conference with Mrs. Q. The teachers also mentioned the worried look which I had noted.

Mrs. Q is an earnest and willing, but rather overworked, mother who has several children younger than Sadie who take a great deal of her time. Mr. and Mrs. Q are of different religious views, and there has been a little friction in matters regarding the education of Sadie. Rather against the better judgment of the mother, Sadie had been put into a religious school and kept there until last year. Mrs. Q had for several years seen the terrorizing influence on Sadie. The child was afraid of every teacher; she felt that she was doing wrong all of the time. It had been impressed upon her that if she did not take a certain stand certain sure harassing results would follow. Mrs. Q at last felt that she must get the child into different surroundings. She herself seemed able to remedy the situation very little. Their means were meager, and her own work was heavy. This school was selected in order that the child might grow away from the idea that all persons in charge of schools must be eager to punish, to misunderstand, and to make unhappy.

I persuaded Mrs. Q to let me give the child three subjects and thus to lighten the burden at school so that Sadie might get a later start in the morning and a little more care at home, and that we make our aim for the year the developing of trust, confidence, and ease with pupils and especially with people in authority.

Sadie is now beginning to be the happy, carefree, and merry child she should be. Of course, now and then there is a little set-back and she is nervous and "weepy," but usually her face is the happiest in a group.

The foregoing cases are a few of the types of problems each dean finds in a school. However, there are many girls referred to the dean's office for correction and advice. These may be roughly grouped as follows:

1. *Disciplinary case.*—Every adviser of girls in these strenuous, extravagant, and social days is kept busy with the disciplinary problems of dress, rouge, too frequent social engagements, vulgar dancing, and free and cheap talk. It is admitted that the correction of such problems is much needed and demands our best effort and wisest decisions. But to cause a skirt to be lengthened, a suggestive dancing position to be corrected,

or the frequency of parties to be lessened is a problem very different and less difficult than to care for a crooked brain connection. Among the disciplinary cases is always found the simple intellectual problem, that is, the child who has not had the training requisite to carry the course. Also there is the volitional case. We are all familiar with the lazy girl who can but will not, the inattentive pupil, and the girl with the "get by" attitude. All of these are disciplinary cases and not what is considered here as the real problem cases.

2. *Physical case.*—The physical case in general includes the girl who is falling behind on account of some physical cause such as malnutrition, physical deformities, diseased organs such as tonsils, and sinus or developmental troubles.

3. *Non-remedial problem case.*—Out of the disciplinary or the physical case often grows the problem case. In the foregoing histories Gertrude Y is a distinct problem. It is non-remedial. Her difficulty was overcome by the correction of a single act, by the removal of a single impediment.

4. *Remedial problem case.*—Florence X and Sadie Q are problem cases of the remedial type. No single act will cure their fears. It takes careful, systematic, and prolonged treatment with accurate checking and constant correction to produce normal reactions and responses.

Summary of cases studied, 1921–22.—During the past year forty-one problem cases have been studied by the dean. Of this number, twenty-five were disciplinary cases of the volitional type; seven were physical cases; five were problem cases of the non-remedial type; and four were problem cases of the remedial type. At the end of the year, thirty-eight of these cases had made definite improvement; seven were discharged from further consideration; and only three showed no improvement.

A PRELIMINARY EXPERIMENTAL STUDY OF TECHNIQUE IN THE MASTERY OF SUBJECT-MATTER IN ELEMENTARY PHYSICAL SCIENCE

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Much emphasis has been laid in recent years on the necessity of teaching children how to study. At the present time, however, there is very little experimental evidence as to the value of the different forms of study recommended. The purpose of this investigation is to determine the value of certain study procedures in the mastery of subject-matter in elementary physical science.

This investigation was suggested to the writer by his experiences as a classroom teacher of boys and girls of the junior high school age. When the writer first began to teach, he assigned a lesson, which was studied at home by the pupils, and on the following day questions were asked about the assigned lesson. A large percentage of the class time was spent in asking questions and in making explanations. Pupil-activity occupied a comparatively small part of the period. The daily lesson was the unit of the work, and it was considered that the lesson had been learned if the class could answer questions on the assignment.

With the introduction of a new objective, namely, that the student obtain a mastery of the ideas and their relationships in a unit of work extending over several days and do this by his own effort, a new problem presented itself. This problem involved the shifting of the emphasis from (1) half-learning and (2) a study of comparatively isolated facts to a mastery of a large number of related facts organized around some common experiences and materials in the life of the pupil. In shifting the emphasis and obtaining thorough assimilation of the whole topic, four lines of attack were followed: (1) that of developing a technique of class instruction designed to give the pupil an overview of some large body of related material, to place the burden of assimilation on the pupil, to insure that the topic be conceived as a whole, and to provide a means for expression by the pupil; (2) that of working out a reorganization of the subject-matter in terms of large units of work; (3) that of making an investigation of the methods of study commonly used by the pupils;

and (4) that of organizing an experimental investigation of the methods of work to determine the kind of study best suited to secure thorough assimilation.

Preliminary investigations of the methods of study commonly used by the pupils disclosed the following significant facts:

1. Many pupils read the text over and over again, re-reading words instead of getting the thought.
2. Many pupils memorize certain parts of the text verbatim. When asked to give the thought expressed, they are utterly at sea.
3. Many pupils read the text sentence by sentence and in the end can answer specific questions but cannot see the contribution of each sentence to the whole.
4. Pupils have no method of checking their mastery of the subject-matter and therefore often understudy or overstudy a topic.
5. Pupils do not study the subject-matter with a definite insight as to what each particular part should contribute to the whole.
6. Very few pupils make any attempt to relate what they read to their past experiences.
7. Many pupils do not take advantage of sign-post paragraphs, topic sentences, and summary sentences and paragraphs.
8. Notes taken on readings are generally reproductions of the textbook. No attempt is made to distinguish between the relative values of different parts of a problem or subtopic.
9. Very little attempt is made by pupils to make the author's organization their own or make their own organization of the subject-matter.

The type of study common among pupils results in the following defects:

1. Pupils are able to answer questions on some phase of a topic but cannot make a recitation on the topic as a whole.
2. If at the end of a unit a written report on the entire unit is required, each fact stands out separately; there is no connection between related facts and no combination of the facts into an organized whole.
3. Pupils can state a principle when it is called for but cannot answer questions based on the application of the principle or give their own interpretation of the meaning of the principle.

The methods of work discovered in this preliminary study indicated the desirability of training in intensive reading which would require the pupil to pick out the essential elements needed for the solution of a problem, to find topic and summary sentences, to weigh the relative value of various parts of a paragraph, to determine the contribution of a paragraph to the subtopic or problem, to grasp the general plan of a large body of subject-matter, and to organize the subject-matter around this general plan.

The following methods of study were selected for this training:

1. Finding the central thought of a paragraph and grouping under it the points needed for its support. This was chosen as one of the factors for training in order to give the pupils practice in weighing the relative values of the various parts of a paragraph, in order to point out the existence and value of the summary sentence, and in order to show that each paragraph makes a definite contribution to the whole.

2. Breaking up the problem into questions. This was chosen as a matter on which training should be centered in order to give the pupils practice in picking out the essential elements needed for the solution of a problem and in order to emphasize the fact that the solution of the problem does not depend on one fact alone but on the combination of all of the facts.

3. Reading first for the general plan of the author and then studying analytically. This type of training was incorporated into the experiment in order to broaden the span of interest of the pupil by giving him a view of the entire field covered by the unit and in order to insure that each pupil become aware of the author's organization with a view to making this organization his own or substituting a self-made organization of the topic.

One test of the comprehension of a principle is the ability to answer questions based on the applications of the principle. It has been noted that most of the pupils can state the principle if it is called for specifically but that they cannot solve questions based on its application. For this reason, practice and instruction in answering questions of application were incorporated into the experiment to determine the effects of specific training versus incidental training.

In order to compare the effects of training along the lines indicated, two classes were selected, one to receive instruction and practice and the other to serve as a control. The experiment was started in October, 1921, and was completed in April, 1922. The detailed procedure adopted and the results obtained are presented in the sections which follow.

THE ORGANIZATION OF THE PROBLEM

Selection of classes.—In order to measure the efficiency of the different methods of study used, it was necessary to obtain two comparable groups. The following factors were taken into consideration in selecting the two classes:

1. Size of the class. During the period of training the time given by the teacher to each pupil must be the same in both classes.
2. Age. Experiments have shown that age is a factor in the ability to grasp the essential thought in any material which is read.
3. Native intelligence. Reading material of the science type is somewhat different from reading general material, and the ability of a student to react to this new situation is affected by his native intelligence.
4. Rate of silent reading. Since the amount of time spent in studying must be kept constant in both classes, the rate of silent reading must be determined. The initial rate of reading must be determined in order to compare the effects of different study methods on this capacity.
5. Ability to interpret what is read. This must be ascertained because the assimilation of the subject-matter depends on the ability to get meaning from the printed page. It is also necessary to determine the initial capacity so that the effects of the different study methods on this ability may be compared.

TABLE I

Age in Months of the Median Pupil and Average Age in Months of Pupils in Class A and Class B

Class	Age of Median Pupil	Average Age	Range of Ages
A..................	176	175.3	144–198
B..................	168.5	168.8	145–192

The two classes chosen for the experiment were composed largely of pupils in the eighth grade of the University High School. Each of these classes contained twenty-eight pupils. During the course of the experiment, two pupils were dropped from each class because of irregular attendance. The experiment, therefore, is based on twenty-six pupils in each class. Table I shows the age in months of the median pupil in each class and the average age in months of each class. The figures presented indicate that there was about six months' difference between the age of the average pupil and the age of the median pupil in each class. The range is approximately the same in both classes.

At the time the experiment was started no data on the intelligence quotients of the pupils were available so that this phase was not considered in the original selection of the classes. It was assumed that the groups were fairly comparable as they were chosen by a random sampling of the whole class. Later on, however, the Terman Group Test of

Mental Ability, Form B, was given to all members of the school. The results confirmed the original assumption. The results also indicated that the intelligence quotient of the median pupil of Class B was slightly higher than that of the median pupil of Class A. The range indicates that Class B contained more pupils of lower intelligence than Class A and that Class B contained more pupils of higher intelligence than Class A.

TABLE II

INTELLIGENCE QUOTIENTS OF MEDIAN PUPIL AND AVERAGE PUPIL IN CLASS A AND CLASS B

Class	I.Q. of Median Pupil	I.Q. of Average Pupil	Range of I.Q.'s
A..................	117	115.2	100–156
B..................	119	118	91–142

TABLE III

RATE OF READING AND COMPREHENSION INDEX OF MEDIAN PUPIL AND AVERAGE PUPIL IN CLASS A AND CLASS B IN THE EAGLE READING TEST

Class	Number of Words Read per Minute		Comprehension Index	
	Median Pupil	Average Pupil	Median Pupil	Average Pupil
A............	245	245	.625	.632
B............	219	215	.600	.599

Two reading tests were given to determine the reading rate and comprehension coefficient of each class. One was a measurement of general reading ability, and the other was a test of ability to read the subject-matter of elementary science.

1. *The eagle test.*—The eagle test was a description of the eagle and his habits and was supplied by W. C. Reavis, principal of the University High School. The pupils were allowed one minute to read; time was called, and each pupil marked the word he was reading. The pupils were then allowed to finish reading the selection. The reading material was collected, and each pupil reproduced what he could of the selection. The number of words read by each pupil was counted to determine the rate per minute. The test contained twenty thought units. The number of units reproduced by each pupil was determined and divided by twenty. This constituted the comprehension index indicated in Table III.

2. *The candle test.*—The candle test consisted of a passage taken from the mimeographed material used as the text in the course in elementary science. The pupils were allowed one minute to read. When time was called, each pupil marked the word he was reading. The reading material was then collected, and each pupil wrote what he could remember of the passage. The selection was divided into thought units by the instructor, and each pupil was scored on the basis of the number of thought units reproduced. From the number of words read, the instructor determined the number of thought units that could have been reproduced by each pupil. The number actually reproduced divided by the total possible number gave the comprehension index. The results are indicated in Table IV. The rate of reading in both classes was in general slower in this than in the earlier test. Class A excelled Class B in both rate of reading and comprehension. Because of the difference in the method of giving the two tests, the interpretation of the two tests is slightly different. The eagle test shows that, with the same amount of material, Class A excelled Class B in ability to interpret. The candle test shows that the members of Class A excelled those of Class B in their ability to interpret what was read in a given time.

TABLE IV

RATE OF READING AND COMPREHENSION INDEX OF MEDIAN PUPIL AND AVERAGE PUPIL IN CLASS A AND CLASS B IN THE CANDLE TEST

Class	Number of Words Read per Minute		Comprehension Index	
	Median Pupil	Average Pupil	Median Pupil	Average Pupil
A............	161.5	171	.585	.570
B............	160 ·	162	.477	.568

Control of variable factors.—As this experiment was carried on under actual school conditions, it was impossible to shift the students from one class to another so that the pupils might be paired on the basis of the test results. Interpretation of the results of this experiment, therefore, must take into consideration the slight differences in reading rate, comprehension of material read, and intelligence as determined by the tests mentioned.

The time spent in study and the amount of material used with the two classes were held constant throughout. The text was in mimeographed form and was handed out at the beginning of each period and collected at the close. All absences were made up on the basis of the time lost.

Since both classes were given the same tests throughout the experiment, it was necessary to eliminate as far as possible the passing of information concerning the tests from one class to another. Also, since it appeared as a result, of the preliminary tests that there was little difference between the two classes, it was decided to select the class which met the last period in the afternoon as the training section. This class has heretofore been called Class B and will be referred to as the directed-study class hereafter. The other class, up to this point called Class A, met the first period in the morning and will hereafter be referred to as the semi-directed-study class. It was thought that less information would reach the other class after school time than during school time. The directed-study class was always given the test first, and if information did filter through, the advantage was with the semi-directed-study class. In order to control this element further, the scores of both classes were assembled and distributed according to rank. The group rank of each member of the class was read to each class. The average score of each class was read to both classes. The members of the directed-study class were made to feel that if they told the members of the other class about the tests, their own group rank would be less and the average of their class would be lowered. This produced a rather keen rivalry between the two classes and very little information, if any, filtered through to the semi-directed-study class.

Occasionally during the study there was an oral presentation by the teacher of some point which appeared to be of general difficulty. In all cases of this kind the procedure was identical in both classes.

In the tests which were given to determine the relative efficiency of the two classes in their mastery of the subject-matter, the answers were all blocked out prior to the grading of the papers. This made the scoring as objective as possible and helped to eliminate the personal equation of the scorer.

The factors mentioned were controlled as nearly as was possible under school conditions. One element only was allowed to vary, the method of instruction. The results presented in subsequent sections of this part of the monograph indicate the efficiency of the methods used.

The following summary is presented of the discussion up to this point.

1. In general reading ability, Class A excelled Class B both in rate of reading and in ability to interpret what was read.

2. In ability to read the subject-matter of elementary physical science Class A excelled Class B both in rate of reading and in comprehension.

3. The intelligence quotient of the median pupil in Class B was slightly higher than the intelligence quotient of the median pupil of Class A.

4. Class A contained more pupils of higher intelligence than Class B.

5. Class B contained more pupils of lower intelligence than Class A.

6. The average pupil of Class A was six months older than the average pupil of Class B.

7. The following factors were kept constant throughout the experiment: time spent in study, amount of material, the tests, the scoring, and the oral presentation by the teacher.

8. The method of the work was allowed to vary, and the results obtained under the different forms of study procedure are a measurement of the efficiency of that method as compared to the method used with the semi-directed-study class.

GENERAL PLAN OF ORGANIZATION AND INSTRUCTION OF ELEMENTARY PHYSICAL SCIENCE

Plan of organization.—In order to make the conduct of the experiment clear, the general plan of organization and instruction in elementary physical science is included as a part of this report. It is not the purpose of this discussion to justify the regular procedure but to measure the results obtained in variations of procedure introduced during what will be described later as the assimilation phase of class work.

The subject-matter of the course in elementary physical science is divided into teaching units. A unit is organized around a naturally related group of phenomena, applications of these phenomena, or materials common in the life of the pupil. The method of organizing the materials of instruction reverses the old order of science in that it starts with the phenomena or applications of science principles rather than with the principles themselves. Each unit emphasizes relatively few principles. As principles are needed in the interpretation of some phenomena or in the understanding of some application, they are introduced and form the generalizations which the pupil takes along to his study of the later units.

In our everyday-life environment there are certain groups of science phenomena which are always thought of under some large concept. "Weather" and "fire" are words describing such groups of phenomena. Our concept of "weather" is thus a complex of air pressure, winds, humidity, evaporation, rain, snow, temperature, clouds, etc. This concept is a typical one under which we may organize a teaching unit. Evaporation and humidity are not teaching units but are part of the large teaching unit "weather." Certain phenomena of science are of interest because of their applications. For example, the phenomenon of electromagnetism is not met with as an abstract phenomenon but is met through its application in the doorbell, telephone, telegraph, etc. The interesting thing to the boy or girl is how messages are sent by electricity. The principle of electromagnetism can be brought out in explaining the operation of the different instruments used in sending messages.

The goal of instruction under the unit plan is not the ability to discuss some abstract principle such as the laws of evaporation or electromagnetism, but rather a clear picture in the mind of the student of the majors factors of weather and their relationships, or of the construction and operation of the different instruments used to communicate messages by electric currents.

The teaching unit is divided into problems. Each problem works out some major division of the unit. The unit, "Fire: how substances burn and produce heat," is divided into the following problems: (1) How is air supplied to a fire? (2) Is all of the air used in burning? (3) How is the fuel supplied in a candle, kerosene lamp, and alcohol burner? (4) How is a gas burner constructed and how does it operate? (5) What happens to materials when they burn? (6) How are stove, furnaces, and fireplaces operated? (7) How are matches made, and why do they catch fire easily? (8) What are the chief causes of destructive fires, and how may they be prevented? (9) How are fires extinguished? The goal is a clear picture in the mind of the student of the requirements for burning; how combustion takes place in our common heating and lighting devices, the cause and prevention of destructive fires, and how fires may be extinguished.

Plan of instruction.—The instruction in each unit is divided into five phases: (1) the preparation or explanation, (2) the presentation, (3) the assimilation, (4) the written report or organization, and (5) the oral report. The technique outlined is the contribution of Professor Henry C. Morrison, Superintendent of the Laboratory Schools, University of Chicago.

In the first phase, preparation, it is the task of the teacher to find out what the pupil already knows about the unit to be studied. For example, in the preparation for the unit "Fire," such questions as the following are asked: What is the best method of building a fire in the woods? How are fires started in stoves and furnaces? What use did primitive man make of fire? After wood burns, what is left? What materials give off a large amount of smoke when they burn? In what ways would your life be changed if there were no fire? What part does fire play in the manufacture of automobiles and other machines? Make a list of the present-day uses of fire. Classify these uses under headings, such as, manufacturing, cooking, etc. These questions serve to connect the unit with the past experiences of the pupils and to raise new questions in their minds. From thirty to fifty minutes are commonly spent on this phase.

After the preparation the teacher presents orally an overview of the entire unit. This overview contains little or no detail but presents to the pupil the general field to be covered in the unit. In the unit "Fire," for example, the presentation sketches man's progress in making fire his servant, the steps in building a fire and the requirements necessary for burning, the change which takes place in a material when it burns, the conversion of the energy of the material burned to heat energy, and the danger of fire in the hands of an inexperienced or careless person. The presentation serves to arouse interest, to present a definite goal for study, and to raise questions for future solution. From twenty to forty minutes are usually spent on this phase. At the end of the presentation, the pupil is required to write in narrative form the story presented by the teacher. These papers are then checked by the teacher to determine how well the pupil understands what has been given. The results obtained from the tests indicate the success of the instructor in teaching what he wished. Any part which is not clear, as indicated by the individual papers, is re-presented until it is clear to all members of the class.

At the beginning of the assimilation phase, the pupil possesses a certain fund of information which has been brought out in the preparation and also a bird's-eye view of the unit. In this phase the pupil turns to books and the laboratory to obtain an understanding of the unit. This is essentially a time for directed study and it extends over a period of ten to twenty days. During this period the pupil is working independently under the supervision of the teacher. His task is to gain an understanding of the unit through reading intensively and extensively and through experimentation in the laboratory. He knows that at the end of the unit a written organization of the whole unit and an oral report on the unit or some phase of it will be required of him. There is no possibility, as in the ordinary recitation, of not being called on to demonstrate his knowledge of the unit. He knows that if he fails he will be required to start all over again and keep on until he succeeds. His success or failure depends largely on his own industry and not on the teacher or the other members of the class. The reading and laboratory work end with the completion of the minimum essentials of the unit as outlined in the text. The abler students will, of course, finish their work before the rest of the class and will turn to extensive reading on related topics or to supplementary experimentation or projects.

The pupil should end the assimilation period with a knowledge of all of the essential facts and principles presented in the unit. His next task is to organize what he has learned. The organization consists of preparing, without the use of notes, a syllabus of the entire unit. This requires the ability to pick out the salient points of the unit and see the interrelationship of the problems which make up the unit. The type of organization is varied for the sake of interest and for the purpose of giving the pupil training in different forms of organization. It may be a topical outline, a sentence outline, or a full account written in narrative form.

The last step in the teaching process is the oral report. The pupil prepares a series of talks on the major phases of the unit and on the unit itself. His objective is to present the important points of the topic so that a listener unfamiliar with the topic will get a clear idea of the subject under discussion. At the end of his recitation, the pupil is subjected to a cross-examination by both teacher and pupils.

METHOD OF EXPERIMENTATION AND RESULTS OBTAINED IN UNIT I, FIRE

In Unit I, Fire, the instructions given for study were identical in both classes. The tests were given at the end of the assimilation period. The results obtained in these tests were used as a basis for the comparison of the two classes when placed under different types of instruction.

The problem for investigation in this unit of study was: How do the semi-directed-study class and the directed-study class compare in their mastery of the subject-matter of elementary physical science when the same study method is used in both classes?

The following instructions were given to both classes at the beginning of the assimilation period; as this is part of the regular procedure, no attempt is made to justify the method used.

How the book is written:

1. The unit title expresses the underlying thought of the entire unit. It supplies the goal for study. The written material in the text and the experi-

ments are the means for giving you a complete understanding of how substances burn and produce heat.

2. The text is divided into a series of problems. Each problem makes a definite contribution to the understanding of the unit.

3. As a rule, the text of the problem contains questions. The purpose of these questions is to break up the problem by raising certain issues which are involved in the solution of the problem. The question contributes to the solution of the problem in the same manner as the problem contributes to the unit.

4. Experiments are found in many problems. The purpose of the experiments is to make clear some fact or principle necessary for the solution of the problem. The conclusion is the important part of the experiment.

5. Many words are underlined to call your attention to them.

6. The underlined sentences are very important. They may be summary sentences, or they may state some important principle or fact.

How to study the unit:

1. Read the problem title carefully. It raises a definite problem, the solution of which is in the text that follows. Keep the problem in mind as you study.

2. Before studying the problem in detail, read quickly through the whole problem to get a general idea of the whole.

3. On the second reading, read carefully, taking notes on the important points. If there is any part which is not clear, raise your hand and ask for help.

4. Before you begin a new problem be sure that you can answer all questions asked in the problem and can give a clear discussion of the solution of the problem.

Four weeks of five class hours each were spent on the study of this unit. During this period there were no recitations. Occasionally there was an oral presentation of some point which the instructor found was not clear. Some of the experiments were performed by the students, and some were performed by the instructor. In all deviations from the ordinary study the same procedure was followed in both classes.

In both classes a few of the abler pupils finished before the rest of the class. These pupils were given additional topics on which to work. The topics assigned were: (1) the history of candle-making, (2) the history of match-making, and (3) the electrolysis of water. These topics were selected because they did not contribute directly to the minimum essentials. The tests given at the end of the unit did not include these extra topics.

Description of the tests used.—In order to measure the results obtained in the various forms of procedure, three types of tests were used. These were the written report, a completion test, and a series of thought questions based on the application of the principles presented. Each type of test was thought to measure a slightly different aspect of the total situation.

The written report was designed to measure the pupil's grasp of the entire unit. In general, it consisted in writing up the entire unit without the use of notes. This involved, on the part of the pupil, an appreciation of the relative values of various parts of the unit and the organization of the subject-matter under certain subtopics. The total number of thought units reproduced constituted the score.

The completion test was designed to measure the pupil's mastery of the technical terms used in the unit and the ability to apply what he learned to a new situation. The material of the completion test presented the main ideas of the entire unit so that this measured the pupil's understanding of the essential facts included in the unit.

The thought questions were intended to measure the ability of the pupil to apply the principles learned to the solution of problems presented in his everyday experience.

A detailed description of the tests used and the method of scoring follows.

The written reports.—At the close of the assimilation period a written test was given on each unit. The entire unit of instruction was broken up into four or five large topics. For example, the unit "Fire" was divided into five topics: (1) requirements for fire, (2) burning in some common heating and lighting devices, (3) methods of starting fires, (4) causes of preventable fires, and (5) how fires are extinguished.

The day before the test, all notes were collected. At the beginning of the test period the following directions were given: "I shall now assign certain topics on which you are to write. First, decide what is included under the topic assigned and then write all you know about it." Topic 1 was then assigned and enough time was allowed so that the slowest member of the class could finish the topic. When all members of the class had finished, Topic 2 was assigned, etc. Two or three days were allowed for the test.

In scoring the test, each topic was blocked out into thought units by the instructor, and each paper was checked against these units. For example, in the topic "requirements for fire" some of the thought units into which the topic was divided were: (1) The burning temperature depends on the kind of material. (2) The ease with which a substance can be raised to its burning temperature depends on the amount of material. (3) Air is supplied by a convection current. (4) The cause of the convection currents is the unequal weight of equal volumes of hot and cold air. An attempt was made to construct the thought units so that all of the ideas called for were necessary parts of the whole. The thought units were blocked out in this manner so as to make the scoring as objective as possible and to eliminate the personal equation of the scorer. Each thought unit was scored as one, and the total score was the sum of the thought units expressed in the different topics.

The completion test.—The entire unit was covered by the completion test. One paragraph of the completion test used in the first unit is as follows:

Air is supplied to a fire by a ——— ———. When air is heated it ——— and then weighs less than an equal ——— of ——— air. ——— pulls the cold air under the warm air, forcing the warm air upwards and so supplies oxygen to the fire. Oxygen is prepared in the laboratory by heating ——— ——— to which has been added a little ——— ———. Pure oxygen combines with the elements listed below to form the compound named in the list at the right.

Element	Compound
Iron	———
Carbon	———
Copper	———

The test was scored by counting the number of blanks correctly filled. The number of blanks in the different units varied from sixty-five to 120.

Thought questions.—Each unit contains certain principles of science. In general, two types of questions involving the recall of the principle may be asked: a review question, calling for the restatement of the principle, or a thought question calling for the solution of some problem which involves the application of the principle. The last type of question was used in this test.

Ten questions such as the following were given. (1) Why are iron bridges always painted? (2) Why are not gases of the air in separate layers, the heaviest at the top? (3) Suppose the ceiling of a room caught fire. Which fire extinguisher would be better to use, a carbon dioxide or Pyrene? Give a reason for your answer. (4) Why are there more "blow outs" of automobile tires in the summer than in the winter?

Each answer was blocked out before the papers were graded: (1) Iron bridges are painted to prevent the oxygen of the air from combining with the iron and causing it to rust. (2) The gases of the air are not in separate layers for two reasons; the molecules are in constant motion and are also kept mixed up by the wind.

Each answer which incorporated the correct idea was scored as one. Partial credit was given if the answer contained more than one part in its solution. The total possible score on each test was ten.

Results obtained by the tests.—Table V shows the number of points obtained by the median pupil in the semi-directed-study and the directed-study classes. In the written report, the number of points obtained by the median pupil in both classes is the same. In the completion test, the semi-directed-study class is slightly in the lead. In the thought questions, the directed-study class is slightly in advance of the semi-directed-study class. The results indicate that the median pupil of the directed-study class was practically equal in ability to the median pupil of the semi-directed-study class, ability being measured by the thoroughness with which the subject-matter of the unit was assimilated.

TABLE V

NUMBER OF POINTS OBTAINED BY THE MEDIAN PUPIL IN THE SEMI-DIRECTED-STUDY CLASS AND THE DIRECTED-STUDY CLASS IN UNIT I

Class	Written Report	Completion Test	Thought Questions
Semi-directed-study class..	52	57	5.5
Directed-study class......	52	56.5	6

TABLE VI

TOTAL NUMBER OF POINTS OBTAINED BY EACH CLASS IN UNIT I

Class	Written Report	Completion Test	Thought Questions
Semi-directed-study class..	1,315	1,450	152
Directed-study class......	1,381	1,444	161

TABLE VII

AVERAGE NUMBER OF POINTS OBTAINED PER PUPIL IN UNIT I

Class	Written Report	Completion Test	Thought Questions
Semi-directed-study class..	50.6	55.8	5.8
Directed-study class......	53.1	55.5	6.2

Table VI and Table VII show the total number of points obtained by each class in the three tests and the average number of points obtained per pupil. The results indicate little difference between the two classes if the average number of points obtained per pupil is taken as the measure.

Table VIII and Figure 1 show the distribution of each class by tertiles. The results obtained in both classes were assembled into one group and then divided into tertiles. Figure 1 is a graph of Table VIII. Tertile 1 represents the highest third of the group; tertile 2 represents the middle third of the group, and tertile 3 represents the lowest third of the group. The results of the written report indicate that the number of pupils belonging to the directed-study class found in the first tertile is greater than the number of pupils of the semi-directed-study class. If the first two tertiles are taken together, the number of pupils in the directed-study class is one less than the number of pupils in the semi-directed-study class. The distribution in the other two tests is practically the same.

TABLE VIII

NUMBER OF PUPILS IN EACH TERTILE WHEN THE SCORES OF BOTH CLASSES IN UNIT I ARE ASSEMBLED IN ONE GROUP

Tertile	Written Report		Completion Test		Thought Questions	
	Semi-directed-Study Class	Directed-Study Class	Semi-directed-Study Class	Directed-Study Class	Semi-directed-Study Class	Directed-Study Class
1...........	6	11	8	9	8	9
2...........	12	6	9	9	9	9
3...........	8	9	9	8	9.	8

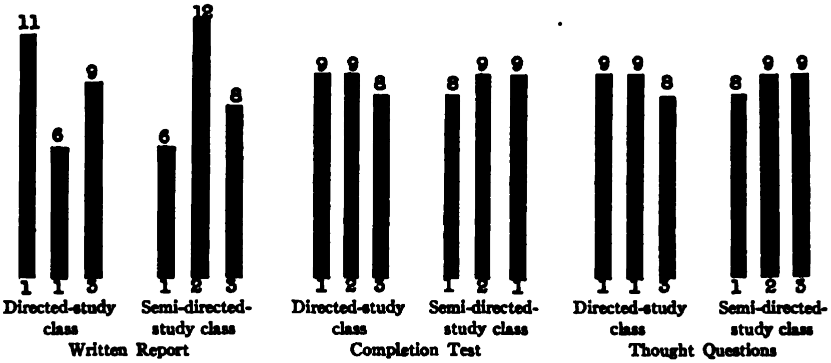


FIG. 1.—Number of pupils in each tertile when the scores of both classes in Unit I are assembled in one group.

When the same study method was used in both classes the results are as follows:

1. The median pupil of each class assimilated the subject-matter of the unit with the same thoroughness.
2. The average number of points obtained per pupil is slightly higher in the directed-study class than in the semi-directed-study class.
3. The directed-study class contained more pupils who thoroughly assimilated the subject-matter than the semi-directed-study class.
4. The two classes contained the same number of pupils who did their work on a relatively low level.
5. The upper two-thirds of the entire group contained an equal number of pupils from both classes.
6. The type of study used in this unit seemed to equalize the differences in the rate of reading and in the interpretation of what was read. This conclusion is based on the comparative equality of the scores obtained by the two classes.

METHOD OF EXPERIMENTATION AND RESULTS OBTAINED IN UNIT II, FUELS

In Unit II, Fuels, the semi-directed-study class followed the instructions given in Unit I. The directed-study class received new study instructions which are indicated with explanatory comments in the following paragraphs. The parts of these paragraphs which are quoted indicate the study directions which were addressed to the pupils. The parts not included within the quotation marks are explanatory comments which will acquaint the reader with the purpose of each section of the directions given to the pupils.

The problem.—What is the value of studying a paragraph to determine its central idea and then picking out the outstanding ideas of the paragraph as compared with the undirected studying of the same subject-matter for the same length of time?

Method of experimentation.—The directed-study class was given the following directions for studying the unit:

1. "Read the problem title carefully and then read quickly through the whole problem. Does the text answer the problem?" This was intended to focus the attention of the pupil on the problem presented and to show him that the subject-matter of the text answered the problem. Reading through the whole problem also gave the pupil an idea of what was involved in the solution of the problem and gave him a sense of the relative value of various parts of the subject-matter.

2. "Read the first paragraph carefully. What is it about? Make up a paragraph heading which will express the central idea and write it in your notebook. Pick out the main ideas in the paragraph and list them in your notebook under the paragraph heading. Repeat, with each paragraph of the other problems." This was intended to call the pupil's attention to topic headings and summary sentences, to make him re-word the essential thought of the paragraph, and to give evidence to the instructor that the pupil thoroughly grasped the contribution made by the paragraph.

3. "Try to answer the problem. The paragraph headings when combined will furnish an outline of the main points needed for its solution." This was included to insure that the pupil grasped the problem as a whole.

Class procedure and observations.—Notes were taken by both classes in this unit. The notes furnished a means of making sure that the directions were followed. In both classes the notes taken on the first three problems were checked by the instructor before the student began the next problem. After the first three problems were completed, the pupils set their own pace, no detailed checking of each problem being made during the rest of the unit. The instructor made sure, however, by frequent observations, that each pupil followed the directions given. The notebooks were collected at the end of the unit, and the notes taken by the two classes were compared.

Observations of the notes taken and the method of study used in the semi-directed-study class revealed the following significant facts:

1. The notes taken were largely a reproduction of the text.
2. Main points and minor points were given equal prominence.
3. More time was spent in writing notes than in the directed-study class, and less time was spent in reading and reflective thinking than in the directed-study class.
4. The notes taken were much more voluminous than those taken in the directed-study class.
5. There appeared to be no relation between the notes taken and the points which were needed for the solution of the problem.

Observations of the notes taken and the method of study used in the directed-study class contributed the following facts:

1. The contribution of each paragraph to the whole was definitely stated.
2. Prominence was given to main points. Minor points were included as subheadings under the main points.
3. The notes were largely expressed in the pupil's own words.

4. Fewer notes were taken than in the semi-directed-study class.

5. More time was spent in reading and reflective thinking than in the semi-directed-study class.

6. At the beginning of the unit, the attention of the pupils was more on the method than on the subject-matter. At first they read a paragraph and then asked themselves: "Now what do I have to do?" They read the mimeographed instructions frequently. Later in the experiment they read the paragraph, thought a while, perhaps re-read the paragraph, and then wrote their notes.

The length of the class period was fifty minutes in the clear. The class met five times per week. Four weeks were spent in the study of this unit.

At the end of the assimilation period, three tests were given: a written report, a completion test, and thought questions. The method of giving the test and of scoring the results was the same as in Unit I.

Results obtained.—Table IX shows the number of points obtained by the median pupil of each class for Units I and II. Inasmuch as the number of points checked in the tests was different in the two units, no absolute comparison can be made between the results obtained in Units I and II. Comparison can be made, however, between the median pupil of one class and the median pupil of the other class for the same unit. In Unit II the median pupil in the directed-study class obtained 4 more points in the written report and 4.5 more points in the completion test than the median pupil of the semi-directed-study class. This represents a total gain of 4 points in the written report and 5 points in the completion test. A gain of .5 point was made by the semi-directed-study class in answering the thought questions. The results indicate that the median pupil of the directed-study class assimilated the subject-matter more thoroughly than the median pupil of the semi-directed-study class. The median pupil in the directed-study class could not, however, apply

TABLE IX

NUMBER OF POINTS OBTAINED BY THE MEDIAN PUPIL IN THE SEMI-DIRECTED-STUDY CLASS AND THE DIRECTED-STUDY CLASS IN UNITS I AND II

CLASS	WRITTEN REPORT		COMPLETION TEST		THOUGHT QUESTIONS	
	I	II	I	II	I	II
Semi-directed-study class..	52	56.5	57	97.5	5.5	7
Directed-study class......	52	60.5	56.5	102	6	7

his knowledge of the principles learned to the solution of problems based on applications of principles to any better advantage than the median pupil of the semi-directed-study class.

Tables X and XI show the total number of points obtained by each class and the average number of points per pupil. The difference in the total number of points obtained by each class in the written report has increased from 66 to 178, making an average gain of 4.3 points in favor of the directed-study class. The total number of points gained by the directed-study class in the completion test was 455, making an average gain of 17.5 points per pupil. The total number of points lost by the directed-study class in the thought questions was 1, making an average loss of .04 point per pupil. The results indicate that the directed-study class attained a more thorough assimilation of the subject-matter than the semi-directed-study class.

TABLE X

TOTAL NUMBER OF POINTS OBTAINED BY THE SEMI-DIRECTED-STUDY CLASS AND THE DIRECTED-STUDY CLASS IN UNITS I AND II

Class	Written Report		Completion Test		Thought Questions	
	I	II	I	II	I	II
Semi-directed-study class..	1,315	1,521	1,450	2,542	152	172
Directed-study class......	1,381	1,699	1,444	2,991	161	180

TABLE XI

AVERAGE NUMBER OF POINTS OBTAINED PER PUPIL IN UNITS I AND II

Class	Written Report		Completion Test		Thought Questions	
	I	II	I	II	I	II
Semi-directed-study class..	50.6	58.5	55.8	97.8	5.8	6.6
Directed-study class......	53.1	65.3	55.5	115.0	6.2	6.9

Table XII and Figure 2 show the number of pupils in each tertile when the scores of both classes are assembled in one group. In the written report the number of pupils in the first tertile of each class remains unchanged. The second tertile from the results on the written report shows an increase in the number of directed-study pupils and a decrease in the number of semi-directed-study pupils. In the third tertile of the written report, the number of pupils from the directed-study class has decreased and the number of pupils from the semi-directed-study class has increased. These results taken in connection with the average number of points per pupil would seem to indicate that the method of study used by the directed-study class proved advantageous to the pupils of the lowest third of that class. This, however, is not altogether certain, because some shifting of the relative position of the different members of the class took place within the class. The completion test shows the same general displacement. The thought questions show comparatively little change. The results indicate that the directed-study class attained a more thorough assimilation of the subject-matter than the semi-directed-study class.

TABLE XII

Number of Pupils in Each Tertile When the Scores of Both Classes in Units I and II Are Assembled in One Group

Tertile	Written Report				Completion Test				Thought Questions			
	Semi-directed-Study Class		Directed-Study Class		Semi-directed-Study Class		Directed-Study Class		Semi-directed-Study Class		Directed-Study Class	
	I	II	I	II	I	II	I	II	I	II	I	II
1	6	6	11	11	8	8	9	9	8	9	9	8
2	12	8	6	9	9	6	9	12	9	7	9	11
3	8	12	9	6	9	12	8	5	9	10	8	7

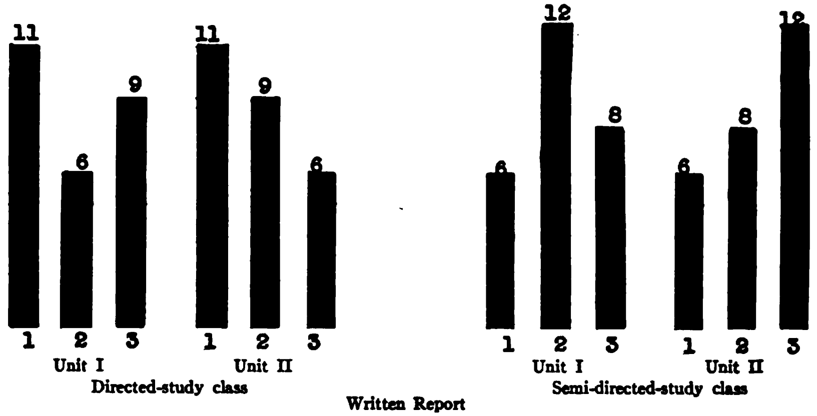
The results obtained indicate that the method of instruction used in the directed-study class was more efficient than the method used in the semi-directed-study class by three standards: score of median pupil, average number of points per pupil, and tertile rank. This increase in efficiency may be due to any of the following causes:

1. The assignment was more definite and the pupil could more easily determine when he had mastered the problem.

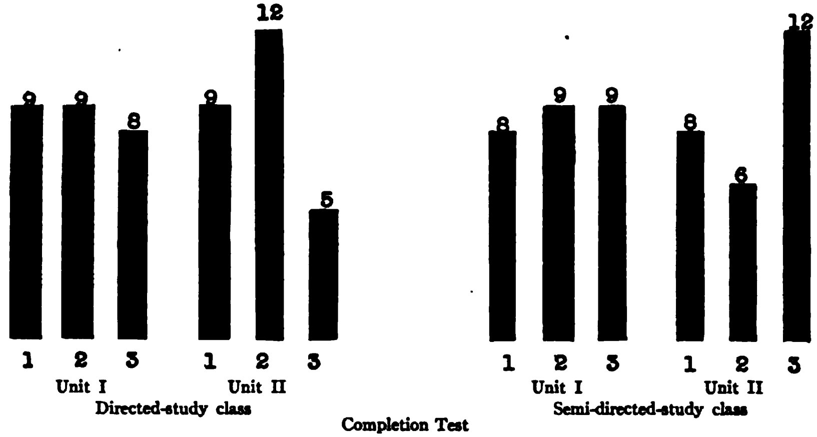
2. In determining the topic sentence of a paragraph the pupil had to weigh the relative values of the various parts of the paragraph to determine the principal thought. This brought about a different reading attitude.

3. The student more clearly saw the organization which the author had in mind. The interdependence of the various paragraphs and the contribution of each to the solution of the problem were more evident.

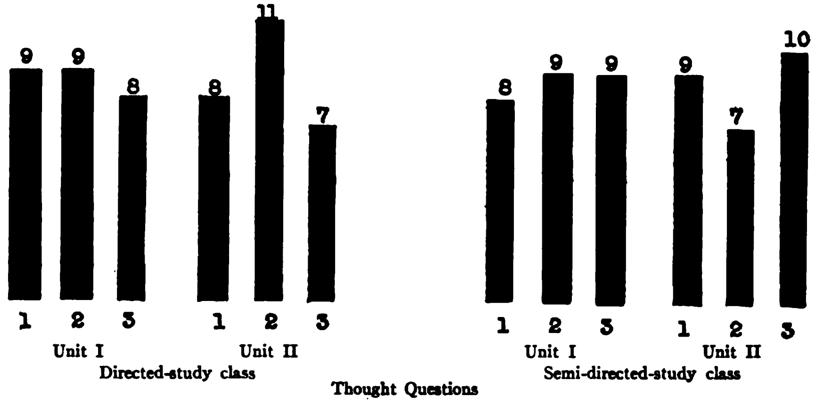
4. The paragraph heading required a restatement in the pupil's own words of the main idea expressed.



Written Report



Completion Test



Thought Questions

FIG. 2.—Number of pupils in each tertile when the scores of both classes in Units I and II are assembled in one group.

5. In reproducing a topic in the written report, the paragraph headings which were stated in the pupil's own words furnished a skeleton on which he could build. This was supported by the fact that the papers written by the directed-study class were much better organized than those written by the semi-directed-study class.

6. The pupils of the directed-study class may have read the text a greater number of times than the pupils of the semi-directed-study class because less time was used in taking notes.

7. The larger gain made in the completion test may have been due to the difference in the construction and scoring of the two tests. In the written report no attempt was made to weigh the points reproduced; consequently minor points received as much credit as major points. The completion test emphasized major points and technical terms. This would seem to indicate that the major points and technical terms were better grasped by the directed-study class than by the semi-directed-study class.

METHOD OF EXPERIMENTATION AND RESULTS OBTAINED IN UNIT III, HEATING BUILDINGS

In Unit III, Heating Buildings, the semi-directed-study class followed the study directions given in Unit I. The directed-study class received instructions for study and was also given practice in formulating questions on the subject-matter.

The problem.—What is the value of formulating the questions one must be able to answer in order thoroughly to understand a topic as compared with undirected study of the same subject-matter for the same length of time?

Method of experimentation.—The directed-study class was given the directions for study which are included with explanatory comments in the following paragraphs.

1. "Read the problem title carefully and then read quickly through the whole problem."

2. "Re-read the problem title. Ask yourself this question: What questions must I be able to answer in order to solve the problem?" This was to focus the attention, first, on the problem as a whole and, second, on the need for an analysis of the problem.

3. "Write the problem in your notebook."

4. "Read each paragraph carefully. Each paragraph contributes a few facts or ideas needed to solve the problem. State the ideas in question form. Put these questions in your notebook." This method

is similar to that of Unit II in that it requires the pupil to find the main ideas of a paragraph, but it goes one step farther in requiring him to think of the ideas in terms of a question which he must be able to answer.

5. "As you study the problem, questions will sometimes be raised in your mind. These questions may be on some part of the text which you do not understand, some facts which are mentioned and which you would like to know more about, or other questions which come to your mind. Keep a record of these questions in your notebook." An attempt was made here to connect the subject-matter with past experiences, to give the pupil a critical attitude when he reads, and to raise further questions in his mind.

Class procedure and observations.—The notes taken furnished a means of checking the method of study in each class. The majority of pupils wrote too many questions on each problem. They did not weigh the relative values of the various parts of the problem. In this respect the notes were similar to those taken by the semi-directed-study class. Very few pupils raised questions as suggested in No. 5. Most of the questions raised were on the wording of the text. It is very probable that more questions would have been raised if this phase had been taken by itself.

Three weeks of five class periods each were spent in the study of this unit. The procedure was the same as in Unit I with the exception that different methods of study were used by the two classes.

Results obtained.—Table XIII shows the number of points obtained by the median pupil in the semi-directed-study class and the directed-study class for Units I, II, and III. As compared with the median pupil in the semi-directed-study class, the median pupil in the directed-study class obtained 12 more points in the written report, 1 more point in the completion test, and the same number of points in the thought questions. This represents an average gain of 12 points in the written

TABLE XIII

NUMBER OF POINTS OBTAINED BY THE MEDIAN PUPIL IN THE SEMI-DIRECTED-STUDY CLASS AND DIRECTED-STUDY CLASS IN UNITS I, II, AND III

CLASS	WRITTEN REPORT			COMPLETION TEST			THOUGHT QUESTIONS		
	I	II	III	I	II	III	I	II	III
Semi-directed-study class....	52	56.5	44.5	57	97.5	56	5.5	7	5
Directed-study class........	52	60.5	56.5	56.5	102	57	6	7	5

report, 1.5 points in the completion test, and a loss of .5 point in the thought questions, if the results are compared with those obtained in Unit I. The results indicate that the method of study used in the directed-study class was of value in the recall of ideas as measured by the written report, of no value in emphasizing major relationships and technical terms as shown by the practical equality of the scores in the completion test, and of no value in enabling the student to solve questions based on the application of principles learned.

Tables XIV and XV show the number of points obtained by each class and the average number of points per pupil. The results show an average gain by the directed-study class of 5.3 points in the written report, 2.2 points in the completion test, and a loss of .23 point in the thought questions as compared with the results obtained in Unit I. These results bear out the results obtained by the median pupil.

TABLE XIV

TOTAL NUMBER OF POINTS OBTAINED BY EACH CLASS IN UNITS I, II, AND III

CLASS	WRITTEN REPORT			COMPLETION TEST			THOUGHT QUESTIONS		
	I	II	III	I	II	III	I	II	III
Semi-directed-study class....	1,315	1,521	1,163	1,450	2,542	1,432	152	172	138
Directed-study class........	1,381	1,699	1,366	1,444	2,991	1,484	161	180	135

TABLE XV

AVERAGE NUMBER OF POINTS OBTAINED PER PUPIL IN UNITS I, II, AND III

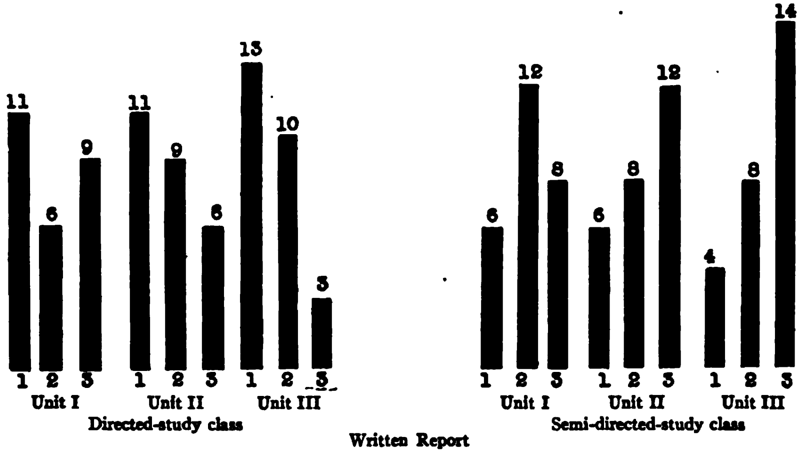
CLASS	WRITTEN REPORT			COMPLETION TEST			THOUGHT QUESTIONS		
	I	II	III	I	II	III	I	II	III
Semi-directed-study class....	50.6	58.5	44.7	55.8	97.8	55.1	5.8	6.6	5.3
Directed-study class........	53.1	65.3	52.5	55.5	115.0	57.1	6.2	6.9	5.2

Table XVI and Figure 3 show the number of pupils in each tertile when the scores of both classes are assembled in one group. The directed-study class shows the following results: (1) in the written report, the number of pupils in the first and second tertiles has increased and the number of pupils in the third tertile has decreased; (2) in the completion test, the number of pupils in the first tertile has increased; the number of pupils in the second tertile has decreased, and the number of pupils

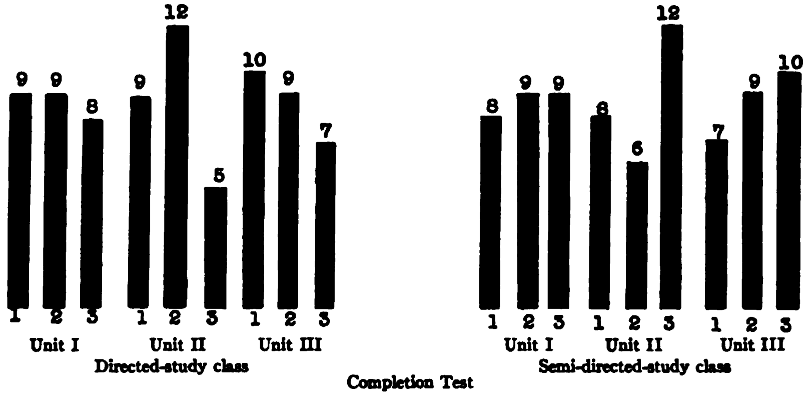
TABLE XVI

NUMBER OF PUPILS IN EACH TERTILE WHEN THE SCORES OF BOTH CLASSES IN UNITS I, II, AND III ARE ASSEMBLED IN ONE GROUP

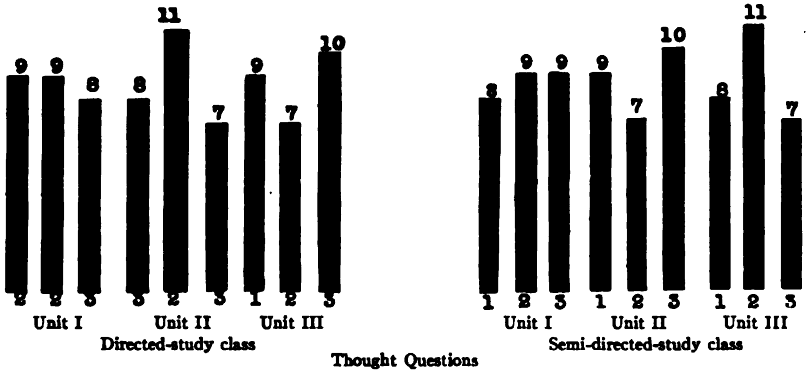
TERTILE	WRITTEN REPORT						COMPLETION TEST						THOUGHT QUESTIONS					
	Semi-directed-Study Class			Directed-Study Class			Semi-directed-Study Class			Directed-Study Class			Semi-directed-Study Class			Directed-Study Class		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
1	6	6	4	11	11	13	8	8	7	9	9	10	8	9	8	9	8	9
2	12	8	8	6	9	10	9	6	9	9	12	9	9	7	11	9	11	7
3	8	12	14	9	6	3	9	12	10	8	5	7	9	10	7	8	7	10



Written Report



Completion Test



Thought Questions

Fig. 3.—Number of pupils in each tertile when the scores of both classes in Units I, II, and III are assembled in one group.

in the third tertile has increased; (3) in the thought questions the number of pupils in the first tertile has increased; the number of pupils in the second tertile has decreased, and the number of pupils in the third tertile has increased. The results indicate a gain in position for the directed-study class in the written report and the completion test and a loss in position in the thought questions.

The results obtained indicate that the method of instruction used in the directed-study class was more efficient than the method used in the semi-directed-study class in the total number of ideas gained from study. It was not more efficient in obtaining an understanding of the technical terms or of the major relationships, or in the application of the principles learned in solving thought questions. The results obtained may be due to, or may be influenced by, the following factors:

1. The majority of the pupils in the directed-study class raised far too many questions.
2. The questions did not emphasize the main ideas and subordinate minor ideas, all of the questions appearing as of equal significance.
3. The method of study was entirely new and involved a different reading attitude.
4. In many cases questions were formulated without regard to the bearing of the answer on the solution of the problem.
5. The method of study used in the previous unit may have inhibited the development of the new method.
6. Selecting the main ideas was a common element in both Unit II and Unit III. Some of the earlier training may have carried over from Unit II.

The results obtained in this unit of study are not conclusive. They indicate that there is one danger in this method of study, namely, that it focuses the attention on detail rather than on major relationships. This danger might be eliminated if the method was carried on for a longer period of time.

METHOD OF EXPERIMENTATION AND RESULTS OBTAINED IN UNIT IV, WEATHER

In Unit IV, Weather, the semi-directed-study class followed the directions given in Unit I. The directed-study class read through the whole unit to determine its general plan and then studied the subject-matter analytically, keeping in mind the general plan.

The problem.—The problem for investigation in this unit was: What is the value of reading a unit entirely through to determine the general plan of the unit and then grouping the major facts presented around this plan, as compared with undirected study of the same subject-matter for the same length of time?

Method of experimentation.—The directed-study class was given special directions for study:

1. "Read quickly through the entire unit."

2. "Read the unit title. Ask yourself this question: What is the plan which the author had in mind when writing this unit? To discover this plan, scan rapidly through the unit and find the major ideas under which the subject-matter is presented. List the major topics in your notebook under the heading, General Plan of the Unit." This was to emphasize the fact that the whole topic is the unit of work and that the different problems of the unit are simply subdivisions of the whole topic. This step involves the organization of the entire unit around a few central subtopics and the organization of these into a meaningful whole.

3. "Now take Item 1 in your general plan and read through that part of the text which relates to it. Watch especially for sign-post paragraphs, summary paragraphs, and topic sentences. Pick out the major ideas which are included under this item. For example, Item 1 might be 'The Wind Belts of the Earth.' This might be subdivided into the doldrums belt of calms, trade winds, and westerly winds. List these subtopics under the general heading and leave seven or eight lines between each one." This step was designed to emphasize further the analysis and organization of the subject-matter. It differs from the method used in Units I and II in that it includes several problems which must be combined under some larger topic.

4. "Study each subtopic carefully to determine the principal facts needed for a complete understanding of the topic. For example, the principal ideas needed in the understanding of the doldrums are their location, cause, direction of air currents, weather, etc. Include these ideas under the subtopic, 'Doldrums.' Use the sentence type of outline as described on page 17, *Manual of Usage*." This is practically the same method as that used in Unit II.

5. "When you have finished studying each item in the general plan, write a summary paragraph which will show how that item contributed to an understanding of weather." This was included to emphasize the unit organization and to insure that the subject-matter was comprehended in relation to its contribution to the whole. It will be noted that the plan outlined starts with an analysis of the unit as a whole and then proceeds to the analysis of smaller and smaller parts of the whole, with a final combination in the light of the whole.

Results obtained.—Table XVII shows the number of points obtained by the median pupil in the semi-directed-study class and the directed-study class in Units I, II, III, and IV. The median pupil in the directed-study class obtained 28 more points in the written report, 6 more points in the completion test, and 1 more point in the thought questions than the median pupil in the semi-directed-study class. This makes an average gain of 28 points in the written report, 6.5 points in the completion test, and .5 point in the thought questions, if the results are compared with those obtained in Unit I. The results indicate that the method of study used by the directed-study class was superior to the method of study used by the semi-directed-study class in all phases of the work.

Table XVIII and Table XIX show the total number of points obtained by each class and the average number of points per pupil. The results show that the average number of points per pupil in the directed-study class was 22.1 points higher in the written report, 5.9 points higher in the completion test, and .7 point higher in the thought questions than the average number of points per pupil in the semi-directed-study class. As compared with the results obtained in Unit I, the results show an average gain of 19.5 points in the written report, 6.04 points in the completion test, and .4 point in the thought questions. The results bear out the results obtained by the median pupil, namely, that the method of study used by the directed-study class was more efficient than the method used by the semi-directed study class.

Table XX and Figure 4 show the distribution of each class by tertiles when the scores of both classes are assembled. In the written report, all of the members of the directed-study class are found in the first two tertiles, which indicates that the poorest pupil in that class made a higher score than the lower third of the semi-directed-study class. The completion tests show a similar displacement although not so marked as in the written report. The results of the thought questions indicate that the directed-study class was slightly more efficient than the semi-directed-study group.

The results obtained indicate that the method of study used by the directed-study class was more efficient in obtaining a thorough assimilation of the subject-matter than the method used by the semi-directed-study class. The results obtained may be due to, or influenced by, the following factors:

1. The method used in the directed-study class was similar to that used in Unit I. The training received in that unit may have functioned in this unit.

TABLE XVII

NUMBER OF POINTS OBTAINED BY THE MEDIAN PUPIL IN THE SEMI-DIRECTED-STUDY CLASS AND THE DIRECTED-STUDY CLASS IN UNITS I, II, III, AND IV

CLASS	WRITTEN REPORT				COMPLETION TEST				THOUGHT QUESTIONS			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Semi-directed-study class	52	56·5	44·5	38	57	97·5	56	83	5·5	7	5	5·5
Directed-study class	52	60.5	56.5	66	56.5	102	57	89	6	7	5	6.5

TABLE XVIII

TOTAL NUMBER OF POINTS OBTAINED BY EACH CLASS IN UNITS I, II, III, AND IV

CLASS	WRITTEN REPORT				COMPLETION TEST				THOUGHT QUESTIONS			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Semi-directed-study class	1,315	1,521	1,163	1,110	1,450	2,542	1,432	2,133	152	172	138	142
Directed-study class	1,381	1,699	1,366	1,684	1,444	2,991	1,484	2,284	161	180	135	160

TABLE XIX

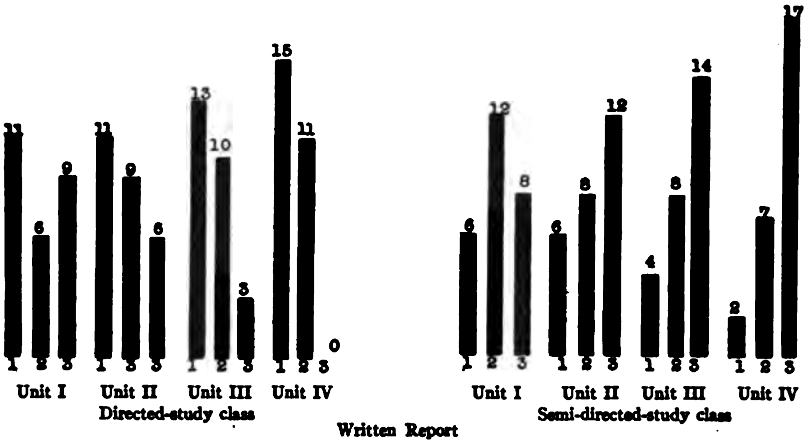
AVERAGE NUMBER OF POINTS OBTAINED PER PUPIL IN UNITS I, II, III, AND IV

CLASS	WRITTEN REPORT				COMPLETION TEST				THOUGHT QUESTIONS			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Semi-directed-study class	50.6	58.5	44.7	42.7	55.8	97.8	55.1	82.0	5.8	6.6	5.3	5.5
Directed-study class	53.1	65.3	52.5	64.8	55.5	115.0	57.1	87.8	6.2	6.9	5.2	6.2

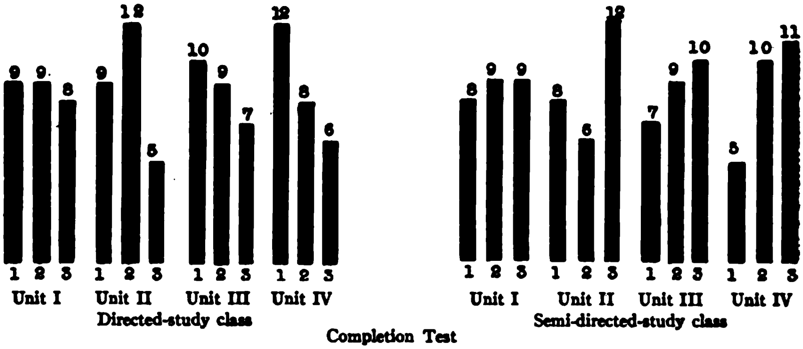
TABLE XX

NUMBER OF PUPILS IN EACH TERTILE WHEN THE SCORES OF BOTH CLASSES IN UNITS I, II, III, AND IV ARE ASSEMBLED IN ONE GROUP

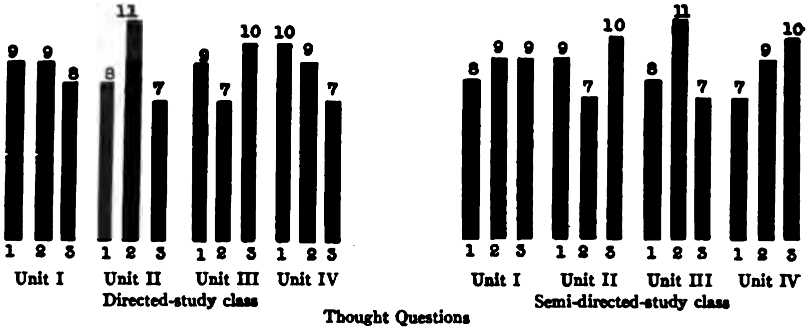
TERTILE	WRITTEN REPORT								COMPLETION TEST								THOUGHT QUESTIONS							
	Semi-directed-Study Class				Directed-Study Class				Semi-directed-Study Class				Directed-Study Class				Semi-directed-Study Class				Directed-Study Class			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
1	6	6	4	2	11	11	13	15	8	8	7	5	9	9	10	12	8	9	8	7	9	8	9	10
2	12	8	8	7	6	9	10	11	9	6	9	10	9	12	9	8	9	7	11	9	9	11	7	9
3	8	12	14	17	9	6	3	0	9	12	10	11	8	5	7	6	9	10	7	10	8	7	10	7



Written Report



Completion Test



Thought Questions

FIG. 4.—Number of pupils in each tertile when the scores of both classes in Units I, II, III, and IV are assembled in one group.

2. The pupils of the directed-study class may have read the text a greater number of times than the semi-directed-study class.
3. Finding the general plan of the unit before the unit was studied analytically may have furnished a more definite objective. The pupil knew where he was going when he studied the subject-matter analytically and was better able to judge the contribution of each idea to the whole, thus giving him a sense of relative values.
4. The results obtained in the completion test reinforce the results obtained in the written report more definitely than in any other unit. This indicates that this method was not only efficient in increasing the total number of ideas gained from study, but was efficient in the mastery of technical terms and the important ideas contained in the subject-matter.
5. The summary of each item in the general plan probably made the plan of organization of the unit more definite. It also compelled the pupil to re-word the text.
6. The method combined in a large measure two steps in the teaching process, the assimilation phase and the organization phase.

METHOD OF EXPERIMENTATION AND RESULTS OBTAINED IN UNIT V, BUILDING MATERIALS

One of the interesting results obtained in the experiment was the lack of increase in ability to solve thought questions when the subject-matter was more thoroughly assimilated. In all but the first unit, the directed-study class had a slightly higher average than the semi-directed-study class, but there was not enough difference to be of much significance. In Unit V, Building Materials, instruction was reversed and the semi-directed-study class received instruction and practice in solving thought questions and the directed-study class received no instruction of this kind.

The problem.—The problem for investigation in this unit was: What is the value of giving the pupils a method for solving thought questions and practice in solving thought questions as compared with no specific training of this sort?

Method of experimentation.—The first day a problem was presented to the class, and a method for solving it was given. The problem was: "Why are iron bridges always painted?" The solution depended on a principle included in the first unit of study.

The method of instruction was as follows:

At first view, this question seems to have no relation to anything which you have studied. In the text you have come across nothing about bridges or paint. A great many times in class I ask you questions which you cannot answer. Then sometimes I re-word the question or break it up into several questions, and then you can answer. In solving a thought question you must first break up or analyze the question. How can we analyze this question? In every question, part of the content furnishes the data for working out the problem and part of the content simply furnishes a situation or setting for the problem. What part of the problem furnishes the setting? (Bridge.) This simplifies the problem into: Why is iron always painted? The question can now be broken up in a number of ways. What does the paint do to the iron? What would happen if the iron was not painted? Here you recall your experiences with painted and unpainted iron. Unpainted iron rusts; painted iron does not. What is rusting? You know that rusting is due to a combination of oxygen with iron. Where do you find oxygen? (In the air.) What effect does the painting of the iron have? (It shuts out the oxygen and thus keeps the iron from rusting.) This is one reason why they paint iron. Is this the only reason? Perhaps they paint it because it looks better. Which do you think is the real reason? What happens to the iron if it rusts? Why do we use iron in building bridges and skyscrapers? If the iron rusts, it gradually wears away and loses its strength. What is your conclusion?

Summary of method of solving thought questions:

1. Analyze the problem by finding the part which furnishes the data for its solution.
2. Break up the problem into questions.
3. Recall any experiences or information you have concerning the problem.
4. On the basis of these ideas, formulate probable solutions of the problem.
5. Test your solutions to determine which is the right one.
6. Answer the problem.

Class procedure and observations.—Two questions of this type were given to the class each day for solution. The questions were assigned at the end of the period, and the solution was brought in the next day. Each pupil was required to follow as nearly as possible the steps given and write out just what he did in solving the problem. Some of the questions given involved the application of several principles which seemed contradictory. These could not be answered without resort to experiment or to reading an authority. In giving an answer, the pupil was made to support his solution. If he could not, his answer was not accepted. At the beginning of the period, ten minutes were spent in solving the questions according to the foregoing plan. The directed-study class used the same method of study as in Unit IV and the semi-directed-study class the method outlined in Unit I.

Three weeks were spent in this kind of training and practice. At the end of the three weeks, sixteen thought questions were given to both classes. None of these questions involved the use of principles on which training had been given.

Results obtained.—Table XXI shows the number of points obtained by the median pupil of each class. The results show that the median pupil of the semi-directed-study class, now the specially trained class, solved 1.41 more thought questions than the median pupil of the directed-study class. This made a gain of 1.46 questions as compared with the results obtained in Unit I. The results indicate that the training and the practice given in solving thought questions were of value.

TABLE XXI

NUMBER OF POINTS OBTAINED BY THE MEDIAN PUPIL IN UNITS I, II, III, IV, AND V

Class	Thought Questions				
	I	II	III	IV	V
Semi-directed-study class...........	5.5	7	5	5.5	9.66
Directed-study class...............	6	7	5	6.5	8.25

TABLE XXII

AVERAGE NUMBER OF POINTS OBTAINED PER PUPIL IN UNITS I, II, III, IV, AND V

Class	Thought Questions				
	I	II	III	IV	V
Semi-directed-study class...........	5.8	6.5	5.3	5.4	9.89
Directed-study class...............	6.1	6.9	5.2	6.1	8.39

Table XXII shows the average number of points obtained per pupil by the semi-directed-study class and the directed-study class. The semi-directed-study class obtained an average of 1.5 more points per pupil than the directed-study class. Compared with the results obtained in Unit I, an average gain of 1.8 points per pupil was made. The results reinforce those obtained by the median pupil.

Table XXIII and Figure 5 show the number of pupils in each tertile when the scores of both classes are assembled in one group. The results show the first difference of any importance in the scores of the two classes in answering thought questions. The number of pupils of the semi-directed-study class in the first two tertiles has greatly increased and the number of pupils of the directed-study class in the first two tertiles has greatly decreased. The results indicate that the training and practice given in solving thought questions secured better results than undirected effort.

TABLE XXIII

NUMBER OF PUPILS IN EACH TERTILE WHEN THE SCORES OF BOTH CLASSES IN UNITS I, II, III, IV, AND V ARE ASSEMBLED IN ONE GROUP

TERTILE	THOUGHT QUESTIONS									
	Semi-directed-Study Class					Directed-Study Class				
	I	II	III	IV	V	I	II	III	IV	V
1.........	8	9	8	7	10	9	8	9	10	7
2.........	9	7	11	9	11	9	11	7	9	7
3.........	9	10	7	10	5	8	7	10	7	12

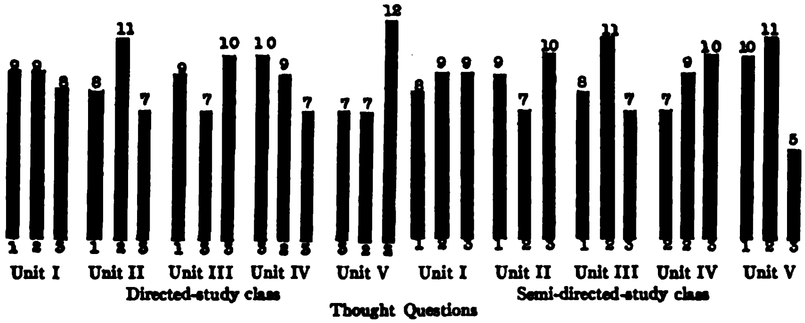


FIG. 5.—Number of pupils in each tertile when the scores of both classes in Units I, II, III, IV, and V are assembled in one group.

The results obtained indicate that special training in solving thought questions is desirable. The results may be due to, or influenced by, the following factors:

1. When the principles were encountered in the study of the unit they may have been brought more sharply into the focus of attention as a result of the training given.

2. The training may have established a relation between cause and effect, giving the pupil a different attitude toward the situation.

3. The training may have enabled the pupil to obtain a better grasp of the problem, systematized his search for a solution, and enabled him to judge the applicability of the experiences recalled.

4. Practice in solving thought questions may have been the chief cause of improvement, or the chief cause may have been a combination of practice and training.

5. One factor was very evident, that of interest. There was keen rivalry between different members of the class in obtaining good answers to the daily questions. They seemed to feel that here was a real measure of their intelligence.

METHOD OF EXPERIMENTATION AND RESULTS OBTAINED—THE EFFECT OF THE TRAINING GIVEN IN SILENT READING

In selecting the classes at the beginning of the experiment, a reading test was given on a passage contained in the mimeographed text. Two other reading tests were given during the course of the experiment, one in December and one in April. The purpose of giving these tests was to determine if the training in study had any effect on the rate of reading and the ability to interpret what was read.

TABLE XXIV

AVERAGE RATE OF READING PER MINUTE AND AVERAGE COMPREHENSION INDEX OF PUPILS IN THE SEMI-DIRECTED-STUDY CLASS AND THE DIRECTED-STUDY CLASS

Class	Average Number of Words Read per Minute			Comprehension Index		
	Candle	Alcohol	Water Supply	Candle	Alcohol	Water Supply
Semi-directed-study class..	171	178	261.4	.570	.407	.491
Directed-study class......	162	160	222.2	.568	.548	.636

The method of giving and scoring the tests is described in the section of this report entitled "Organization of the Problem." The first test was a description of the burning candle; the second, a description of the manufacture of industrial alcohol; and the third, a description of a water-supply system.

In interpreting the results in Table XXIV it must be borne in mind that the comprehension index is based on the amount read in one minute of time. The results show that at the beginning of the year the average rate of the semi-directed-study class was nine words per minute higher than the average rate of the directed-study class. In December the difference was eighteen words per minute; and in April, thirty-nine words per minute. The difficulty of the material was not standardized so that it is impossible to determine whether the difference is due to a decrease in rate on the part of the directed-study class as compared with no change on the part of the semi-directed-study class or to an increase in the rate of the semi-directed-study class as compared with no change on the part of the directed-study class. It is probable that a combination of these factors influenced the score. At the beginning of the year there was practically no difference in the average scores obtained by each class in interpreting and reproducing what was read. In December, the directed-study class reproduced on an average 14.1 per cent more of what they read in one minute of time than the semi-directed-study class, and in April the directed-study class reproduced 14.5 per cent more. The results show a gain on the part of the directed-study class in interpreting and reproducing what is read.

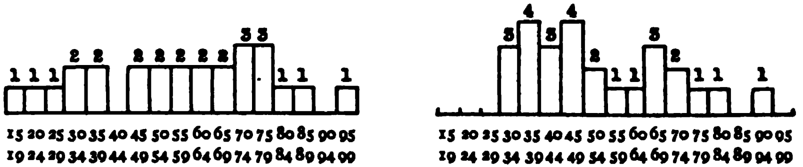
TABLE XXV

READING RATE PER MINUTE AND COMPREHENSION INDEX OF THE MEDIAN PUPIL IN THE SEMI-DIRECTED-STUDY CLASS AND THE DIRECTED-STUDY CLASS

Class	Average Number of Words Read per Minute			Comprehension Index		
	Candle	Alcohol	Water Supply	Candle	Alcohol	Water Supply
Semi-directed-study class..	161.5	175.5	252.5	.585	.408	.500
Directed-study class......	160	143.5	217	.477	.531	.625

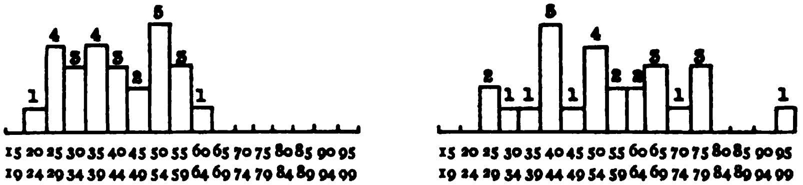
Table XXV shows the scores made by the median pupil of each class in rate and comprehension. The results show the same trend as the average score. At the beginning of the year the median pupil of the directed-study class reproduced over 10 per cent more than the median pupil of the semi-directed-study class. This would indicate a total gain of more than 20 per cent for the median pupil of the directed-study class.

Figure 6 shows the distribution of the scores made by each class in interpreting and reproducing what was read in the candle test, the alcohol test, and the water-supply test. The results obtained in the candle test, which was given during October, show that the scores of the semi-directed-study class are distributed over a wider range than the scores of the directed-study class and that the scores of the directed-study class are concentrated at the lower end of the scale while the scores of the semi-directed-study class are fairly evenly distributed. The results obtained in the alcohol test, which was given during December, show that the rate of reading of the semi-directed-study class increased, that the rate of reading of the directed-study class decreased (Table XXV), and that the amount reproduced by the directed-study class was greater than the amount reproduced by the semi-directed-study class. The results obtained in the water-supply test, given in April, show a decided superiority of the directed-study class in interpreting and reproducing what was read.



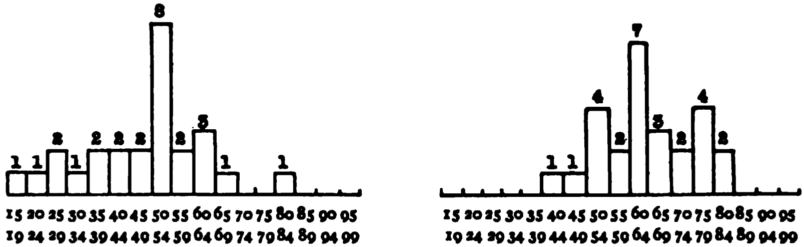
Semi-directed-study class Directed-study class

Candle Test



Semi-directed-study class Directed-study class

Alcohol Test



Semi-directed-study class Directed-study class

Water-Supply Test

FIG. 6.—Distribution of scores in the candle test, alcohol test, and the water-supply test.

The following conclusions may be drawn from this section of the report:

1. Training in making various types of analysis of the subject-matter increases the ability of the student to interpret and reproduce what he reads.

2. Although it was impossible to measure accurately the increase in the rate of reading because the tests were not standardized, the results

indicate that the type of instruction used resulted in an increase in the rate of reading in both classes, but that the increase was greater in the class which was not required to analyze the subject-matter studied. This increase in rate may have been brought about by (1) a greater familiarity with the subject-matter of science, resulting in a shorter period of visual fixation, (2) practice in rapid silent reading, (3) the reduction of the number of visual fixations per line, (4) an appreciation of the value of rapid silent reading, and other similar factors. The difference in the rate of reading of the two classes is probably due to a difference in the reading attitude. The directed-study class had received much practice in analytical reading which probably functioned as a habit.

GENERAL CONCLUSIONS

1. Specific training in finding the central thought of a paragraph, determining the questions one must be able to answer in order to obtain an adequate understanding of a topic, and reading an entire block of material through for its general plan, results in a more thorough comprehension of the subject-matter than undirected study on the same material.

2. Specific training and practice in answering thought questions based on the application of some scientific principle are more efficient than incidental training in answering thought questions.

3. Training the pupil to make various types of analyses of the subject-matter increases the ability of the pupil to interpret and reproduce what he reads.

4. The gain in rate of silent reading is greater if the pupil is not required to make an analysis of what he reads.

CURRICULUM IN HISTORY

A. A TWO-YEAR SEQUENCE IN HIGH-SCHOOL HISTORY

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The problem and proposed solutions.—For years the pressure on the secondary-school curriculum has been so heavy that the work in history required for graduation by the great majority of high schools has been limited to one or two years. In most instances, however, a wide range of courses, including as a rule the history of the United States, England, medieval and modern times, the ancient world, economic and commercial development, and the world, has been offered. In the schools in which historical study is limited to a single year pupils usually pursue either American or ancient history. In those in which two years are given to the study a wider variation obtains; probably the most common practice is for pupils to take American history for one year and ancient, European, or world-history for one year.

The large number of pupils who study history for only one or two years makes the problem of the content of such courses an important one. Various solutions have been proposed. The Committee on Social Studies of the National Education Association, in its report of 1916, suggested as a two years' sequence: first, European history to approximately the end of the seventeenth century (one year); second, European history (including English) since approximately the end of the seventeenth century (one-half year); and third, American history since the seventeenth century (one-half year). If three years should be available for the work, the committee recommended that the time given to the last two courses be extended to one year each. The Committee on History and Education for Citizenship of the American Historical Association, in its report published in 1921, recommended for the tenth grade a course in European history since 1650 (one year) and for the eleventh grade a course in United States history during the national period (one year).

During the past four years the Department of Social Science of the Laboratory Schools of the University of Chicago has been at work on the problem. For reasons to be set forth later, it has developed a two-year sequence in history consisting of, first, a course called Survey of Civilization which includes a study of the progress of man from primitive times to approximately 1750 (one year) and, second, a course called Modern History which comprises the story of Europe and the United States since 1750 (one year). A brief description of these courses and a statement of the reasons which underlie them follow.

Survey of Civilization.—The course in Survey of Civilization is open to Sophomores. It consists for the most part of a series of cross-sectional studies of the chief phases of human progress from the earliest times to the middle of the eighteenth century. It includes such topics as primitive times, oriental civilization, Greek culture, Roman civilization, and medieval life. In the study of each of these units, the chief emphasis is placed on customs, industries, manners, religious beliefs, and institutions. Each topic is joined to the one which follows it by a narrative thread, although narrative history as such is strictly subordinated to the study of the life of the time, especially in the earlier units of the course.

This selection and the organization of material rest on the following convictions: (1) a knowledge of certain phases of the ancient world is still of value to the youth of today, for, as George Burton Adams points out, the modern world owes much of its religious beliefs to the ancient Hebrews, of its art and philosophy to the Greeks, of its legal and administrative practices to the Romans, and of its civil and political institutions to the Germanic tribes; (2) the type of material used in the course is peculiarly well adapted to the interests and capacities of the adolescent boys and girls for whom it is intended; (3) the basis of organization makes possible the establishment of a sense of development or historical continuity; and (4) the course includes the most significant features of the distant past without that encyclopedic condensation of material which is so characteristic of most courses in world-history. Thus, because of its adaptation to the capacity of the pupils, its value in interpreting the present, its importance in conveying a sense of historical continuity, and its inclusion of what seems to be most worth while in the history of ancient, medieval, and colonial times, the course in Survey of Civilization is placed first in this two-year sequence in high-school history.

Modern History.—Modern History, the second unit in this sequence, is open to Juniors and Seniors. It consists of a combination of European history and American history since approximately 1750, chief stress being placed on those phases of the period which concern the United States. In contrast with the course in Survey of Civilization emphasis is placed on the narrative. There is this difference in stress (1) because the history of Europe and America during the last century and a half does not include many marked transformations in civilization and (2) because, as the world of today is approached, narrative elements become of increasing interpretative value in enabling one to understand present-day social and industrial conditions and problems.

The advantages in this organization of modern history are (1) that, when studied after the course in Survey of Civilization, it completes a unified and coherent view of the evolution of human progress; (2) that it enables pupils who can study history only one year to obtain a fair understanding of both modern European and American history; and (3) that it presents the development of the United States in its true light—as a phase of world-history and not as an isolated narrative. Such topics as the Industrial Revolution, the Monroe Doctrine, immigration, financial panics, the silver question, imperialism, and the world-war can, in fact, be rightly understood only when seen from a world-viewpoint and in their international aspects. Even such a subject as the anti-slavery crusade can be truly appreciated only when seen as a part of the general humanitarian movement which began to sweep over Europe as well as over America during the fourth decade of the nineteenth century. To quote from an article previously published.

> The truth is that the nations of the earth, including the United States, do not, and have not, lived in separate, water-tight compartments. Our civilization is of European origin, our people of European stock, millions of them of European birth, our problems at times of the very web of European life. With our entrance into the world-war our isolation vanished, if indeed it ever existed. The forces which have moved the world the past century and longer—democracy, nationality, science, economics—have not been confined by state lines, but have exerted their power everywhere. By combining modern American and European history this unity in human life becomes evident and the tendency toward provincial thinking, all too characteristic of the American people, can to some extent be remedied. In this way combination will enable history better to serve present human needs.[1]

Relation to other social studies.—A wrong impression concerning this two-year sequence in history would be created if this discussion were to end without a word concerning the other courses in social science offered in the University High School. The first of these courses, called Community Life, is taken before any of the courses in history. It consists of a study of some of the chief activities and problems of modern life. It is taught in combination with the beginning work in English and is taken for one year by all pupils in the school.[1]

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[1] Howard C. Hill, "Social Sciences in the University High School," *School Review*, XXVII (November, 1919), 691.

The concluding course in the regular sequence of social studies is entitled American Institutions.[2] This course consists of a combination of the elements of political science, economics, and sociology.

Conclusion.—The courses in the social studies offered in the University High School, then, begin with community life as a study of the present. This course is followed by a two-year sequence in history in which a survey is made of human progress from remote times to the world of today. As a fitting conclusion to the work, a course in American Institutions brings to the attention of the pupils the institutions and unsettled questions of our own times. By this arrangement the past and the present are linked together, and both are made more intelligible than either would be standing alone, for the present can be understood only in the light of the past and the past can be comprehended only in the light of the present.

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[1] For a detailed description of this course see "Opportunities for Correlation between Community Life and English," *School Review*, XXX (January, February, March, 1922), 24–36, 118–26, 175–86.

[2] In addition, a course in ancient history intended primarily for pupils expecting to attend institutions which still demand the subject for entrance credit is given; a course in European history for junior-college students is also offered.

CURRICULUM IN HISTORY—*Continued*

B. SURVEY OF CIVILIZATION

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Administration.—The Survey of Civilization has been taught for some three years, with gradual modifications of the original plan in order to bring it within the comprehension of second-year high-school pupils. It is of the usual length, covering the school year of thirty-six weeks. Classes meet five days a week, and the recitation periods are fifty minutes in length. The pupils are from twelve to fifteen years of age. The course has been elected each year by thirty-five to forty pupils from a Sophomore class of about one hundred. It may be submitted as the history unit required for graduation.

The organization of the course, as modified by the experience of the past three years, follows. It is not set forth as final but as the tentative result of experiment.

OUTLINE OF THE COURSE IN SURVEY OF CIVILIZATION

I. Primitive life and oriental civilization
  1. Primitive man
  2. Oriental lands and peoples
  3. Egypt, the cradle of civilization
    a) Political development
    b) Egyptian civilization: the Nile Valley—the inundation, irrigation, agriculture, river traffic, trading centers, the bazaar, the craftsmen, the nobles, the Pharaoh, the warrior class, the priesthood, the temples, worship, the sacred books, hieroglyphics and writing, the scribes, architecture, the plastic arts, engineering, the sciences
  4. Features of oriental civilization
  5. Westward march of oriental civilization

II. Greece—a world enlightened
  1. Expansion of the Greek world
    a) The Aegean home
    b) Colonial expansion
    c) Commerce and industry
    d) Rise of democracy

    - *e*) The Persian war
    - *f*) The Athenian empire
  - 2. Athenian civilization: Attica and Athens—the land, farming, the market-place, shops and the crafts, the port town, warehouses, factories, slavery, classes of the people, the leisure class, open-air life, places of resort, education, direct government, discussion, public opinion, Athens as an art center, the acropolis, public buildings, sculpture, the sophists, philosophy, writers, books and readers, the drama, history, oratory, philosophy, the academy, the first university
  - 3. Eastward march of Greek civilization
    - *a*) Rise of Macedon
    - *b*) Conquest of the East
    - *c*) The Macedonian empires
    - *d*) The Alexandrian age
  - 4. Influence on Rome
- III. Rome—a world consolidated
  - 1. Growth of the Roman power
    - *a*) Rome and Italy
      - (1) Environment
      - (2) Early institutions
      - (3) Expansion in Italy
    - *b*) Mediterranean expansion
      - (1) Duel with Carthage
      - (2) Eastern wars
    - *c*) End of the republic
      - (1) Effects of conquests
      - (2) Struggle for reform
      - (3) Rise of the military power
      - (4) Establishment of empire
  - 2. Roman life and civilization
    - *a*) Life of the Romans: the imperial city—population, sanitary conditions, water supply, fire and police, administration, day of the noble, position of woman, education, amusements, clubs, books and libraries, travel, country life, industry, petty trade, money and coinage, capital and investment
    - *b*) The world under Roman rule: area and population, the rim of barbarism, the frontiers, the army, the provinces, civil service, law and justice, the census and taxation, the municipal centers, communication, the Roman roads, waterways, centers of trade and industry, manufacturing, the guilds, slavery, social classes, class feeling, philanthropy, social evils, morality
    - *c*) Maturity of ancient civilization: unifying influences, growth of Roman world, Greco-Roman civilization, heritage of the modern world

3. Breaking up of the Roman world
    - *a*) Causes of decline
    - *b*) Growth of despotism
    - *c*) Rise of the church

IV. The Middle Age—transition to modern civilization
1. The Dark Ages
    - *a*) The barbarian migrations
    - *b*) Rise of the Franks
    - *c*) Empire of Charlemagne
    - *d*) The Invasions of the Northmen
2. Medieval life and civilization
    - *a*) Feudalism: raids and invasions, self-help, feudal relations, lord and vassal, mutual obligations, the feudal court, feudal justice, feudal warfare, the feudal army, the castle, living conditions, training the knight, jousts and tournaments, chivalry, the manor, tillage, serfs and villeins, the village, life of the peasants, self-sufficiency of the manor
    - *b*) The church: church organization—the Pope, the clergy, the councils, the monastic orders, monastic discipline, the monastery, occupations of the monks, services to civilization, the parish priests, the church as a social center, church worship, the sacraments, excommunication and interdict, the church courts, heresy, the temporal power of the Pope, the rise of the friars, the Franciscans
    - *c*) Life in the towns: growth of towns—population, walls, sanitation, streets, lighting, police, public buildings, government, dwellings, furniture, food and clothing, schools, great teachers, universities, studies, use of Latin, medieval superstitions, medieval art, the cathedral builders

V. The crusading movement
1. The Eastern situation
    - *a*) Rise of the Saracens
    - *b*) Civilization of the Saracens
    - *c*) The Byzantine empire and its civilization
2. The Crusades
    - *a*) Causes of the crusades—conditions in Western Europe
    - *b*) The first crusade
    - *c*) Episodes from the later crusades
    - *d*) Results—to Western Europe

VI. Beginnings of the modern world—the expansion of commerce and the great awakening
1. Rise of the towns
2. Commerce and communication: the merchant guilds, the craft guilds, fairs and markets, trade routes, traffic and transit, money and coinage,

banking, associations and companies, improvements in navigation, trade with the Indies, explorations, voyages, discoveries
3. The great awakening: cities of Italy, intellectual awakening, revival of classical study, humanism, use of the vernacular, great writers, revival of the arts, the old masters, rise of modern science, the great scientists, inventions, printing, gunpowder, the compass, widening of the horizon, discontent with the church, forerunners of reform
4. Rise of modern nations from medieval origins

VII. Colonial expansion and the new world
  1. Contest for colonial empire
    a) England and France as European powers
    b) Colonial domains of the French and English
    c) Resources and colonial policy
    d) Struggle for the mastery
    e) Outcome of the struggle
  2. Colonial life and civilization: conditions—farming, labor, slavery, resources, water-power, industry, fisheries, commerce, navigation acts, exports and imports, money, living conditions, furniture, food, clothing, amusements, travel, roads, the church, sects, liberalism, education, schools, colleges, books, newspapers, reading public, postal system
  3. Independence and union
    a) The Revolution
    b) Union and federation

Content.—This outline shows the arrangement of the large units in the course in the Survey of Civilization. In most cases the large unit embraces both narrative and descriptive topics. For example, in the last unit the struggle for colonial supremacy in America is followed by a cross-sectional treatment of American colonial life and civilization.

The purpose of the course is to give the pupils a clear conception of the great movements of history and an adequate understanding of typical civilizations of the past. In practice, the plan involves presenting these civilizations in sequence with the narrative thread as the connecting link. The topics selected for this purpose are the empire in Egypt, the Periclean age in Athens, the imperial epoch in Rome, the medieval age, the Renaissance, and American colonial life. The study of civilization is stressed, as the name of the course suggests, several weeks being devoted to the study of each of the cross-sections. In covering the cross-sections enough time is devoted to Athenian life, for example, to give the pupil an adequate concept of what the real Athens was and what her influence in history has meant. Through discursive reading and discussion, the life of the people, how they got their living, and how they employed their leisure become very real matters to the class. Thus the pupil not only gains a knowledge of Athenian life but also builds up his historical background and his understanding of the various aspects of community life.

Procedure.—In handling the narrative topics, texts have been used which are written in narrative style and avoid the encyclopedic condensation characteristic of older texts. The practice is to use a single text for the study of the narrative material with a guidance sheet in the shape of a topical outline. The importance of mastering the text is impressed on the student by intensive reading. The narrative is covered rapidly in a series of floor talks. Discussion is minimized and questions and answers are eliminated so far as is consistent with clearness and understanding.

In handling the descriptive topics, the method of procedure is as follows. At the outset is the exploration, which gives the teacher opportunity to interrogate the pupils on their knowledge of the topic in hand. This does not presuppose preparation; usually direct questions are asked, calling for brief answers. The following day the teacher proceeds with an oral exposition of the topic. The presentation is not of the nature of a lecture, but is rather an animated sketch of salient features. This occupies not more than half the period, and during the remainder of the hour the class is asked to reproduce in written form the chief features of the presentation. Standards are set in regard to form, and the pupils are expected to register a high level of performance in handwriting, spelling, and expression. The following is a sample presentation test written by a thirteen-year-old boy.[1]

THE CIVILIZATION OF THE ROMANS UNDER THE EMPIRE

In the two centuries of peace following the beginning of the empire there were a number of influences which tended to make the empire a great unit or organism. The first of these was the service in the army. The provincials served in the army for twenty years under Roman discipline and methods, and when they retired at the end of this period they were usually thoroughly Romanized.

The territory of the empire was more unified by the boundary policy of Augustus and the walls of later emperors. The provinces were usually left with their same boundaries and were allowed to continue as much as possible in their own habits and customs. However, they were ruled by the Roman provincial governors who were usually chosen from the senatorial party. These men were used to ruling and being obeyed and were, therefore, a great factor in Romanization.

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[1] It should be borne in mind that the presentation test here exhibited represents no studied preparation. It is simply the pupil's reproduction of the picture painted in words by the teacher.

The city states, though dependent on Rome, were allowed to have their own petty politics and government much as the government system of Rome was run. In this way they did not become discontented.

The law systems which Rome inaugurated were the nucleus of our present law and were one of their greatest legacies to us, not only from the standpoint of law for man, but also from the standpoint of law for nations.

From a commercial point of view Rome and the empire were greatly unified by the great road system. Though the roads were built primarily with military purposes in mind and for the messengers of the emperor they were a great factor in trade. In the same way the Mediterranean touching most all parts of the empire was a factor in trade. Many great commercial cities sprang up, frequently where the Greek colonies had been.

Most all labor was done by the slave class because this class had grown larger and work was not looked upon except as very disagreeable and low. Besides it made free labor much lower in standard and in wages. On the other hand, the number of slaves later decreased due to the Stoic religion which became so popular, causing freeing of slaves.

Farming was always looked upon by the Romans as very important. In time the small intensively cultivated farms of the peninsula gave way to great plantations owned by capitalists in the western provinces. These men were expected to improve the communities by public works and buildings.

Probably the final fall of the empire was due to slavery because it caused labor to be disliked and it made the class system more rigid.

The class is expected to carry over the sketch of the topic inherent in the presentation as a guide to their work in assimilation, the step which follows the presentation. This is of the nature of supervised study and is carried on in the classroom during a succession of class periods. In this procedure the class has the opportunity of assimilating the material dealing with the topic in hand. Textbooks, reference books, maps, and charts are placed in the classroom at the convenience of the students. The pupils receive at the start a guidance sheet which presents a series of important topics with appropriate references. Each member of the class proceeds to collect the evidence on these topics from the various reference books and to organize this material provisionally in his notes. During the work of assimilation, the teacher is at hand to give assistance when needed. A sample topic is taken up with the class, and with the aid of sketch outlines on the board the mechanics of organization are shown. It is the practice to vary the matter of note-taking by intensive reading, readings from the sources, debates, class discussions, and reports by members of the class. These are used discriminatingly as aids in the assimilation process.

After the assimilation process is completed, the pupils register their reaction in the organization and the recitation.[1] They organize the topic in the shape of a topical or analytical outline. A class period is allowed for the organization. This exercise covers several pages and is used as a guide in the recitation. The written recitation may cover one or more periods, according to the size of the topic. In the oral recitation the pupils are expected to make floor-talks, covering the whole topic or some large subdivision of the topic. In accordance with the character of the topic, either written or oral work is demanded, or a combination of both types of work.

In assigning reports the pupils are referred to a posted list of approved topics with references. These are designed to illustrate the various phases of the topic in hand. Each pupil prepares a topical outline for his paper which he presents to the teacher for approval and criticism. This is used as the basis of a floor-talk of some five minutes in length. These reports are given during the assimilation period, generally toward the end. They give training to those who report and opportunity to the rest of the class for assimilation. The oral work seems generally preferable to the reading of written reports, which is apt to be an invitation to inattention. The class is sometimes asked to keep a record of the chief points made in these reports. The pupils who complete their work in advance of the others are given an opportunity to continue their study of the topic and to take excursions along by-paths which have proved attractive to them. In grading the class the pupils who have done extra work receive excess credit, if the work is of a nature in volume and quality to warrant it. Students who present reports of unusual excellence are expected to write up their reports in permanent form for preservation in the library.

The following topics will suggest the content of the reports: "The Pyramid Builders," "Irrigation in Egypt," "Hieroglyphics and Decipherment," "The Potters of Athens," "The Production of a Play," "The Greek Games," "The Parthenon," "The Roman Aqueducts," "Travel and Correspondence," "The Roman Roads," "Slavery among the Romans," "The Medieval Castle," "Medieval Warfare," "The Gothic Cathedrals," "The Craft Guilds," "Venetian Commerce," "Italian Painting," "Chaucer's *Canterbury Tales*," "Henry the Navigator."

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[1] It should be noted that this is done without aid from printed or written material.

Material.—In handling the descriptive topics material is selected which is adapted to the age and intelligence of the children. The recent textbooks in history give increasing space to this type of material as distinguished from narrative history. These accounts give the child the basic facts; but for extensive reading, books are suitable which are written from the imaginative viewpoint in story form. These books are in many cases written by scholars and are dependable and are not mere digests of fact. The pupil has access to a variety of books of this sort which appeal to his love of action and movement. Out of a number of such books the following titles have made a particular appeal to the students: Maspero, *Life in Ancient Egypt and Assyria;* Tucker, *Life in the Roman World;* Tappan, *When Knights Were Bold;* Davis, *A Day in Old Athens;* and Earle, *Home Life in Colonial Days.* Books of this type which have proved to be of unusual value are duplicated so as to permit their use by all of the members of a class during the study of the topic to which they relate. Extensive reading can be done to advantage at home or in the study periods, and duplication should be made with that end in view. It is our experience that the success of the course has been due in large measure to the duplication of titles, thus insuring prompt access to material desired on the part of all students. For library reading, it has been found that there should be a copy of the book in question for every six students taking the course, in case the school day has six periods. In such books as Davis or Tucker, many of the students read the whole book rapidly before taking up the class work on Athens or Rome. With interesting reading of this sort, it is found hardly necessary to motivate the reading or to check the amount. After one experience the students discover the value of this reading for their work of note-taking and for a more assured mastery of the material.

It is also our practice to make use of imaginative literature and especially of fiction. While some historical novels are in style and content rather difficult for the average child, the usable literature in this field is too valuable to be neglected. It is the practice in the Survey of Civilization to post a list of novels which have been approved by the teacher, arranged, for the convenience of the students in reading, according to the periods treated. To motivate the reading and to assist the teacher in checking the amount read, it is the practice for each student to hand in immediately on completing a book a brief appreciation and criticism. The notations by the students should be on cards or slips of uniform size in order that they may be filed for future reference. In case a number of students have read the same book it is found interesting and worth while to have a brief class discussion of its value. Suggestions with regard to the points or divisions to be taken up in this written appreciation are made by the teacher.

Some of the students have read widely in this field. One girl, an average student, read during the school year fourteen novels and showed by her criticisms that the reading of these novels had been an educational influence as well as a real adventure. She began to show a more vital interest in her class work and a better understanding of history in her papers. Another girl in the same class read twelve books. These are exceptional cases, and such extensive reading might be an unwise procedure for some students. The teacher can warn students who seem to be reading to the disadvantage of their class work. Naturally, the students who are interested are apt to do this reading, but the reverse is also true that thereby the laggards become interested in historical reading and study. The following criticisms by students may be of interest:

Ebers, *Uarda.*—The story is very wonderfully told, with a vim to it that carries every thought home to the reader. *Uarda* is full of color and richness, as all the books by Ebers are. The story is about the life of the Egyptians; the life of the monks is interestingly told; and the plots and intrigue going on in the supposedly pure and sacred community are amazing. The story is historical, and there is a tremendously thrilling scene in a battle where King Rameses second is deserted by his men in the midst of the battle, and his lions are fighting for him, when the hero comes to the rescue.

Newman, *Callista.*—Callista is a Greek girl who, though at first opposed to Christianity, is converted finally. She is so sincere and believes so thoroughly in her religion, and is so pure, that after her death by torture on the rack, her body remains perfect. There seems to be a light around her head, and a man with an evil spirit is healed by touching her feet. She becomes St. Callista. The book is very much like a notebook or journal. The events are loosely connected. I was not especially attracted by the book, although I enjoyed many of the descriptions. There seemed to be "much ado about nothing."

Farrar, *Darkness and Dawn.*—This book contrasts the frivolous and unhappy life of the noble class, Nero in particular, with the hard-working and happy life of the lower classes, especially bringing out a striking contrast between the Christians, most of whom belonged to the lower class, and the pagans of the upper class. The many details of the story serve to give one a good idea of what the life of the Romans under Nero was like.

Bulwer Lytton, *Harold.*—This is a story that stirs the blood and awakens in the reader a lively interest. It is full of martial deeds, court intrigues, and dread schemes, but it is not gay. There is throughout the story an undercurrent of gloom, deep and dark. This is due to the old Norse and Danish superstitions which have not yet been rooted out by Christianity.

Reade, *The Cloister and the Hearth.*—The simple home life and the many homely customs associated with it, the many dangers which beset the traveler, the varied customs in the different countries, the gay life at Rome, the quiet of the cloister, all are pictured clearly, and throughout the story the romance runs, made more interesting because of the background and atmosphere that surround it.

In the community-life course, the present and the past are linked by studying the present forms of community institutions and functions and tracing these back to their origins. In this course, which in large part deals with the remote past, the pupils are kept in touch with the present by reference to present-day events, conditions, and tendencies. In pursuance of this aim, cartoons have been found to be valuable aids. A cartoon on good roads has a new meaning to a class which has been studying the road system of the Roman world. It is the practice to post the cartoon on the bulletin board and to allow the class to volunteer for the privilege of explaining it. The student who goes to the board is asked first to describe the cartoon for the benefit of those who are seated and then to interpret what the author meant by his graphic editorial. The class is asked for criticisms, comments, and suggestions.

In dealing with the civilization of the past it is the practice, wherever advisable, to make use of the sources for purposes of illustration. They are found particularly useful in illustrating modes of thought in which the past differs from the present. It is found convenient in getting this material before the class to have the best selections mimeographed and distributed to the class to be retained or returned. The selections are discussed directly by the class, and the teacher aids whenever necessary with suggestion and interpretation.

In handling the descriptive material, a great deal of attention has been given to visualization. It does not by any means take care of itself, as the illustrations in the text are often passed over by the students without notice. In the class work, illustrations in the text, mounted photographs, stereographs, and the pictorial album or *Bilderbuch* have been used. For ancient civilization, the *Bilderbuch* has been found particularly useful, the book in use being in duplicate with a sufficient number to supply the whole class. The copies are placed on the double desks at which the students sit and are used in connection with the class study of any topic and to illustrate the reports given by the students.

In the medieval and modern periods, charts or wall pictures of historical scenes are valuable. Examples of this type of illustrative material are the following: the Cybulski charts of classical subjects; the Lehmann pictures, to illustrate medieval and modern history; and the A.L. pictures to illustrate English history. These charts are carefully constructed by artists, with the advice of historical scholars, to make some pictorial and dramatic appeal to the children. Some of the subjects are the Greek temple, the Roman house, the Teutonic court of justice, the tournament, the castle, the monastery, the craft guild, the Hanse town, the crusaders on the march, the Canterbury pilgrims. It is our practice to have these charts mounted in a head which keeps the set together. It is found advisable to keep them before the students until they become familiar with the special features involved in the pictures. They are used by the teacher in illustrating his talks or are assigned to individual students for the purpose of review.

The charts lead naturally to map material. The blackboard outline maps are used by the teacher to show historical situations and movements. They are found very useful in isolating geographical phenomena and in showing political relations and changes. In the Survey of Civilization the pupils are required to make the following maps: the Oriental World, the Expansion of the Greek World, the Athenian Empire, the Greek World under Alexander, the Expansion of Rome, the Roman World under the Empire, the Empires of the Franks and the Saracens, the European States and the Crusading Routes, the Voyages of Discovery and Exploration, and the European Colonial Empires. The directions for making these maps, both general and specific, are mimeographed, and copies are given to the students. The maps are handed in, graded, and returned. In some cases the maps are set as problem work and made after outside preparation as class exercises.

Conclusion.—In teaching this course the teacher finds that the great period covered is in a way an advantage. It becomes necessary to eliminate from the narrative all that is nonessential. Attention is concentrated on the great movements and large features of history. The study of what is typical in the civilizations of the past gives emphasis to the elements which are of permanent value in history and which appeal to the pupils' interests.

CURRICULUM IN HISTORY—*Continued*

C. A COURSE IN MODERN HISTORY

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Nature and classification of course.—The course in Modern History consists of a combination of the chief movements and most significant features in the history of the United States and Europe since the middle of the eighteenth century. The course continues for one year; admission is limited to Juniors and Seniors. While there are at present no prerequisites except the work in community life, it is strongly recommended that the course in Survey of Civilization be taken during the Sophomore year.

Plan of organization and crediting.—The material in the course is organized as a series of teachable blocks or units and is conducted throughout the year on the topical basis. In order to receive credit toward graduation pupils are required to do their work at the mastery level, that is, to demonstrate to the satisfaction of the instructor their mastery of the minimal essentials in each unit of the course. Related material, organized in the form of additional-credit units, affords opportunity for the more diligent or capable pupils to gratify genuine intellectual tastes and, by doing supplementary work, to shorten the period ordinarily required for graduation.[1] The minimal essentials and illustrations of additional-credit projects in the course follow.

GENERAL OUTLINE OF COURSE IN MODERN HISTORY

I. The Industrial Revolution
  1. Minimal essentials:
    a) The domestic system of industry: manufacturing, trade, commerce, transportation, communication, agriculture
    b) The development of the textile industries and the coming of the factory

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[1] For the details of the credit system consult the *Manual of the University High School* (1922), pp. 18–19. For a discussion of "mastery" see H. C. Morrison's "Studies in High-School Procedure," *School Review*, XXIX (January, February, March, 1921), 19–30, 106–18, 182–97; also Carleton E. Preston's "'Getting By': a Problem of High School Morale," *Educational Review*, LXII (March, 1922), 211–26.

  - *c*) Improvements in transportation, 1760–1830: roads, canals, steamboats, railroads
  - *d*) Chief results: economic, social, political
- 2. Supplementary projects:
  - *a*) The early history of the steel industry
  - *b*) The agricultural revolution
  - *c*) The development of mining
  - *d*) Lives of inventors (select one)
  - *e*) The beginning of the industrial revolution in America
  - *f*) Early socialistic experiments

II. The French Revolution

- 1. Minimal essentials:
  - *a*) Conditions under the old régime: social classes, autocracy and inefficiency of government, privileges and abuses
  - *b*) The intellectual revolution: discoveries in the natural sciences and their influence; philosophers in the social sciences—Voltaire, Montesquieu, Rousseau
  - *c*) French Revolution, 1789–95: financial troubles of the king; influence of the American Revolution; epochal events—Oath of the Tennis Court, fall of the Bastile, Declaration of the Rights of Man; chief reforms of the National Assembly and the Convention
  - *d*) Napoleon, 1795–1815: outbreak of the war in Europe; the rise of Napoleon; the spread of revolutionary ideas and reforms throughout Europe; effect of events on the United States—political factions, XYZ affair, Alien and Sedition Acts, war with France, Louisiana purchase
  - *e*) Heritage of the Revolution: political, social, intellectual
- 2. Supplementary projects:
  - *a*) The benevolent despots
  - *b*) Famous leaders of the Revolution
  - *c*) The Reign of Terror
  - *d*) The career of Napoleon
  - *e*) The Continental System
  - *f*) Jefferson's embargo policy

III. The Era of Metternich

- 1. Minimal essentials:
  - *a*) The Congress of Vienna and its work: international problems, composition and activities of the Congress, the treaties
  - *b*) Metternich and reaction in Austria, Germany, France, and Spain, 1815–30
  - *c*) The Holy Alliance and the Monroe Doctrine
  - *d*) The revolutions of 1830 and 1848: causes, characteristics, outcome, effect on emigration to the United States

- 2. Supplementary projects:
    - *a*) Prominent leaders of the period
    - *b*) The rise of Prussia
    - *c*) The revolutions in Spanish America, 1808–21
    - *d*) The industrial revolution in France or Germany

IV. The development of nationality
- 1. Minimal essentials:
    - *a*) The second French Empire: establishment, domestic policy of Napoleon III, foreign policy and ambitions
    - *b*) The unification of Germany: forces for and against union, Zollverein, Bismarck and the blood and iron policy, establishment of German Empire
    - *c*) The unification of Italy: obstacles, chief leaders in movement, diplomacy and reforms of Cavour, establishment of Kingdom of Italy, acquisition of Venetia, Rome, and Italia irredenta
- 2. Supplementary projects:
    - *a*) Life of Cavour
    - *b*) Life of Bismarck
    - *c*) The rise of Louis Napoleon
    - *d*) The French Mexican Expedition
    - *e*) The internal policy of Napoleon III
    - *f*) Louis Blanc and the "National Workshops"
    - *g*) The authorship of the Monroe Doctrine

V. The slavery controversy
- 1. Minimal essentials:
    - *a*) Early history of slavery in America, 1619–1819; slavery in the colonies, decline during the Revolutionary period, effect of the cotton gin
    - *b*) Slavery as an institution: family life, labor conditions, discipline, slave-trade, recreation, economic advantages and disadvantages
    - *c*) Struggles over the extension of slavery, 1819–60: Missouri Compromise, 1820; abolitionist movement; Compromise of 1850; Kansas-Nebraska Act, 1854; Dred Scott decision, 1857; Lincoln-Douglas debates; election of 1860
    - *d*) The Civil War and emancipation, 1861–65: comparison of the North and the South, grand strategy of the war, Emancipation Proclamation and the Thirteenth Amendment, victory of the Unionists—comparison with unification of Italy and of Germany
    - *e*) The reading of *Uncle Tom's Cabin* (or some other historical novel relating to the topic) and a biography or the memoirs or autobiography of one of the notable personages of the time
- 2. Supplementary projects:
    - *a*) Religious beliefs of the slaves
    - *b*) The underground railway

    - *c*) The Christian Sanitary Commission
    - *d*) Lincoln's attitude on slavery
    - *e*) John Quincy Adams and the "Gag Resolution"
    - *f*) Synopses and criticisms of biographies, personal narratives, or historical novels dealing with the topic

VI. The westward movement

- 1. Minimal essentials:
    - *a*) The settlement of the Middle West, *c.* 1775–1840: historic background—early explorers and settlers, settlement of Tennessee and Kentucky, occupation of the Northwest and the Southwest, movement across the Mississippi, foreign immigration and its effect
    - *b*) Life on the frontier: homes, occupations, education, religion, manners, amusements, ideals
    - *c*) The development of transportation: steamboat, roads, canals, railroads
    - *d*) The disappearance of the frontier and the development of the conservation movement: significance of the frontier in American history, waste of natural resources, origin and growth of the conservation movement, present-day activities in conservation
- 2. Supplementary projects:
    - *a*) The development of communication
    - *b*) The early land policy of the United States
    - *c*) Agricultural machinery and the occupation of the West
    - *d*) Pioneer mining and mining settlements
    - *e*) Early settlements in Illinois
    - *f*) The building of the Northern Pacific Railroad
    - *g*) The Granger movement

VII. Expansion of the industrial nations

- 1. Minimal essentials:
    - *a*) The Industrial Revolution and world-expansion
    - *b*) The partition of Africa: reasons, activities of Great Britain, France, Germany, and other countries
    - *c*) The opening of Asia to the Western world: India, China, Japan, Russia, attitude of the United States—the open door
    - *d*) World-expansion of the United States: continental growth, Alaska, Hawaii, Samoa, Philippines and Porto Rico, Panama, Virgin Islands
- 2. Supplementary projects:
    - *a*) Livingstone and Stanley in Africa
    - *b*) Perry and the opening of Japan
    - *c*) The "open-door" policy
    - *d*) Railway construction in the Far East

- *e*) The rubber trade in the Congo region
- *f*) Japan in Korea
- *g*) The United States in Haiti or Nicaragua

VIII. The world-war and world-reconstruction

1. Minimal essentials:
   - *a*) Background of the war: industrialism, colonial expansion, the alliances, rivalry between Germany and Great Britain, diplomatic crises—Morocco, Serbia
   - *b*) Immediate causes of the war: Serbia, Belgium
   - *c*) Submarine warfare and the entrance of the United States into the struggle
   - *d*) Reconstruction: Peace Conference at Versailles, League of Nations, Limitation of Armaments Conference at Washington
2. Supplementary projects:
   - *a*) Military phases of the war in Europe
   - *b*) The war on the sea
   - *c*) The war in Asia or Africa
   - *d*) Why the United States entered the war
   - *e*) South America and the war
   - *f*) The work of the League of Nations
   - *g*) Germany and reparations

In organizing and teaching this course a constant effort is made to link the past with the present. The topical arrangement of material is well adapted to fulfil this purpose. For example, in teaching the Industrial Revolution, the first topic in the course, it is easy to point out that, although historians refer ordinarily to the changes which took place in industry between 1750 and 1830 as the Industrial Revolution, we are still living in the same great era and that the invention in recent years of the automobile, the multipress, the airplane, the internal-combustion gas engine, and radio telephony constitutes developments similar in character and equal in importance, perhaps, to the spinning jenny, the power loom, the cotton gin, the steamboat, and the locomotive.

In like manner it is easy to show, on the one hand, the connection between the principles of liberty, fraternity, and equality of the French Revolution and the principles of the Allies in the world-war; and, on the other hand, the similarity between the philosophy and policies of the ruling powers in the Age of Metternich and those for which the Central Powers stood during the late world-catastrophe. In studying the fourth topic, also, pupils have no difficulty in recognizing the operation of the force of nationality, which was so potent in unifying Germany and Italy, in the developments which are taking place in our own day in Ireland, Poland, Greece, Armenia, and China.

The connection between the slavery controversy of two generations ago and the negro problem and solid South of the first quarter of the twentieth century is also easily discernible. Equally apparent, when pointed out, is the relation between the westward movement with its wastefulness and the conservation activities of late years. Comment on the last two topics, in so far as they touch the matter under discussion, is unnecessary; each of them is so closely joined to current problems and events that the linking of the past and the present is practically inevitable.

In cases like these, certain phases of contemporary history form integral parts of the subject-matter of a unit; in other instances the relation between earlier times and the world of today is brought out by the instructor. It is obvious that the constant connection or union of the happenings and movements of bygone days with those of our own time—a feature which constitutes so important a characteristic of this course—tends both to promote a historical attitude of mind in the pupils who study the subject and to give them an intelligent appreciation of the world in which they live.

Materials.—The textbooks in this course are McLaughlin's *History of the American Nation* (Appleton) and Schapiro's *Modern and Contemporary European History* (Houghton Mifflin). The great mass of the reading, however, falls in supplementary material. Since instruction is conducted primarily on the laboratory basis, most of the books and other references used in the study of a given unit are brought from the library to the recitation room where they are kept until the topic is completed. The titles most in demand are duplicated in such quantities as to provide one copy for every three to five pupils. As a rule from 100 to 200 volumes are available on each topic. On the average the reading of the pupils on each topic is from 300 to 500 pages.

Among the most useful books are Halsey's *Great Epochs in American History*, Hayes' *Political and Social History of Modern Europe*, Barstow's *Westward Movement*, Paxson's *Recent History of the United States*, Hazen's *Modern European History*, Robinson and Beard's *Development of Modern Europe*, Hart's *Social and Economic Forces in America*, Haworth's *The United States in Our Own Times*, Hart's *American History as Told by Contemporaries*, Mathew's *French Revolution*, Charnwood's *Life of Abraham Lincoln*, Wilson's *Division and Reunion*, Bassett's *Short History of the United States*, Rhodes' *History of the United States*, Sparks' *Expansion of the American People*, Smiles' *Lives of the Inventors*, Muzzey's *Readings in American History*, Osgood's *History of Industry*, and Davis' *Roots of the War*.

Method of instruction.—The method of instruction employed in the course is partially Herbartian and is similar to the methods used in other content courses in the University High School. It is the contribution of Professor Henry C. Morrison, Superintendent of the Laboratory Schools. The following steps are taken in the study of each unit: exploration, presentation, assimilation, organization, and recitation. Each of these will be explained in turn.

1. *Exploration.*—The first step in the teaching of a new topic is exploration or preparation. Without previous assignment of work—in the ordinary sense of the term there is at no time assignment of work to be done outside the classroom—the pupils appear in class and are questioned by the teacher concerning their knowledge of the new unit. This knowledge is the product of previous study in the elementary school, of outside reading in histories, periodicals, newspapers, and novels, and of bits of information which pupils have "picked up" at random from the conversation of their elders, from sermons and lectures, at motion-picture plays, and in other ways.

As a rule, such knowledge is fragmentary and unorganized in character, and the answers to the questions reveal both astonishing bits of information as well as amazing instances of ignorance. For example, in answer to the question: "What were the motives which drew the first settlers to Virginia?" eight pupils in one class replied, "a desire for religious freedom"; four, "to get rich and go back to England"; three, "to improve their economic condition"; one, "to raise cotton"; one, "love of adventure"; and one, "tyrannical government in England." Other questions brought out the fact that only two members of the class knew who the Cavaliers were; a few did not remember that they had ever learned anything about Captain John Smith, while one girl insisted that she had never heard of Pocahontas. In response to the suggestion that she must have heard the story of the saving of Smith's life by the Indian princess, she exclaimed, "Oh, no, we had nothing as exciting as that!" As a rule, pupils are quite ignorant of causal relationships. On the other hand, information on a few phases of American history is so general—the territorial expansion of the United States is an instance—that little time needs to be spent on them in this course.

The work in exploration serves two main purposes. It indicates to the teacher the foundation on which he must build, and it arouses among the pupils an interest in the new topic. It thus motivates the work and at the same time promotes economy in education by avoiding the reteaching of what is already known.

2. *Presentation.*—The next step in instruction is presentation. Here the teacher sketches the new topic in a talk of from fifteen to twenty-five minutes. By the use of broad, sweeping strokes rather than by employing a mass of details he endeavors to give in as clear and interesting a way as possible a bird's-eye view of the period or movement to be studied. Ordinarily, a presentation includes a concise exposition of the chief causes or forces which lie back of the movement in question, a rapid sketch of the narrative, and a brief explanation of its historical significance.

Pupils are not expected to take notes during the presentation. Nor are they permitted to interrupt with questions or remarks. They are encouraged, however, to note on a scratch pad any questions which come into their minds, comments which they would like to make, and points or episodes which they would like to have explained again. The number and character of such queries and remarks form a good index to the interest and intelligent curiosity aroused by the sketch of the topic. Usually a period of twenty or thirty minutes exhausts the supply of inquiries, but there have been occasions when a period and a half have been usefully employed in this way.

In accordance with the ideal of mastery referred to previously, pupils are required after the presentation to explain in writing their understanding of the new topic. From the standpoint of content, the papers are regarded as satisfactory if they reveal a clear, well-organized, coherent, and rounded-out conception of the topic. A mere summary, even though it contains no errors, does not of itself comprise an acceptable paper, for unrelated facts are regarded as of slight value. Emphasis, in short, is placed primarily on *comprehension* and not on *memory*. It should be stated, also, that only such papers as are couched in effective English, are free from mechanical errors, and are written in a neat, painstaking manner are acceptable; all others must be re-written.

After the test, the topic is presented again to those pupils whose papers indicate a lack of understanding. If a large proportion of the class fails in the first presentation test, the usual practice is to go over the topic a second time with the entire group: otherwise, those pupils whose papers are acceptable proceed with assimilation while the presentation is given again to the remaining members of the class. The second presentation, of course, varies in content and emphasis in accordance with the difficulties and the mistakes of the pupils as revealed in the test papers. The chief purposes of the test are to reveal to the teacher those pupils who have not grasped the topic and to enable him to revise his presentation in both form and content so as to meet their needs.

As a rule, the large majority of a class succeed on the second presentation if not on the first; occasionally, however, there are individual pupils who need to write their presentation test papers as often as three or four times. Table I shows the record of a class of nineteen pupils during the year 1921–22.

TABLE I

NUMBER OF TIMES PUPILS WERE REQUIRED TO WRITE PRESENTATION TESTS BEFORE THEIR WORK WAS ACCEPTED

PRESENTATION TEST	DATE OF TEST	NUMBER OF PUPILS TAKING TEST	NUMBER OF WRITINGS				
			1	2	3	4	Total
1. Industrial Revolution........	October	19	0	15	4	0	42
2. French Revolution..........	November	19	14	4	1	0	25
3. Era of Metternich...........	December	19	11	7	1	0	28
4. Development of nationality...	January	18	14	3	1	0	23
5. Slavery controversy..........	February	19	13	5	0	1	27
6. Westward movement.........	March	19	15	3	0	1	25
7. Expansion of the industrial nations	April	19	16	3	0	0	22
8. World-war and world-reconstruction.................	May	19	15	4	0	0	23

The prime purposes in presentation are, first, to orient the pupils in the new unit so that they can study it with intelligence and expedition and, second, to stimulate their interest, already aroused by exploration, so that they will begin work on the topic with enthusiasm.

3. *Assimilation.*—The third step in the teaching procedure is assimilation. Until this stage is reached pupils for the most part are passive or receptive, not active; as yet they have had no assignment of work and, as a rule, have done no reading. A change takes place at this point. Under the direction of the teacher they now begin the study of the topic.

As a guide to the work, each pupil is given mimeographed sheets containing the minimal essentials, specific references to each topic, and suggestions for additional credit work. After distributing the guidance sheets, the teacher comments on the different topics; describes and evaluates various reading references; calls attention to points on which notes should be taken, maps made, or outlines prepared; and suggests ways of beginning and carrying on study. The pupils then secure books from the shelves and begin their work.

The teacher's time during assimilation is occupied largely in discovering the difficulties of individual pupils and in suggesting ways for overcoming them. He directs pupils to the references best fitted for them;

goes over their notes and outlines with them; explains hard passages in their reading and points out relationships between events; and, by illustration, hint, and question, endeavors to correct bad habits of study and to guide pupils into more effective methods of work.

Matters which cause common difficulty are taken up with the class as a whole; special reports on various features of the work are occasionally made by pupils; debates are held now and then; certain phases of the topic frequently form the basis of class discussion. The ordinary question-and-answer recitation, however, has no place at any time in the instructional program. The time spent in assimilation, from the standpoint of the teacher, is very fruitful, not only in guiding boys and girls into effective habits of work, but in revealing significant phases of the learning process.

4. *Organization.*—By oral and written tests of various kinds the degree of mastery which pupils are attaining is ascertained from time to time while assimilation is in progress. When the evidence indicates that the mastery level has been reached the next step in instruction is taken. In this step, called organization, pupils are expected to make a complete, systematic, and well-ordered written outline of the topic as a whole. This outline must be prepared without assistance from the teacher and without the help of notes, books, or other material. It represents the pupil's ability to handle subject-matter which he is believed to have mastered and it must be the result of his own unaided effort.

The organization paper is not intended as a test, although in fact it constitutes a very severe one. Its prime purpose lies in its value as a step in the learning process. Information which cannot be managed, which cannot be arranged, and which cannot be analyzed into constituent parts subject to evaluation as of major or minor importance, is of slight utility. It is primarily for the purpose of providing training of this sort that organization is included in the teaching program. It is open to question whether there is any other exercise or device which is so effective in bringing home to pupils, first, the significance of a topic as a whole; second, an appreciation of the distinct phases of a historical movement and their relation to one another; third, an ability to discriminate between points of major consequence and those which are of relatively minor importance; and, fourth, a realization of the vital importance of being able to put one's information on a given topic in a well-ordered and logical form. A systematic organization paper indicates mental power of no mean order.

5. *Recitation.*—The last step in the method of instruction used in the course is the recitation. Pupils are now expected to present in an interesting and fluent manner the topic which has been the subject of study. From the standpoint of intellectual mastery the validity of this step of instruction rests primarily on the belief that there is a high correlation between expression and comprehension; that the effort to explain to someone else a topic or movement is in itself thought-clarifying; that, indeed, it is open to question whether a pupil ever thoroughly understands a topic until he can make it clear to another.

Sometimes the recitation takes the form of floor-talks before the class; at other times it is put in writing; frequently both forms are employed. In the floor-talk a pupil is expected to give in clear and effective English an exposition or narration of any phase of the topic on which he may be asked to speak. In general, he is permitted to use his organization paper as a guide during recitation, but he may be asked to speak without it.

As a rule, floor-talks are limited to five or ten minutes in length, but it is not uncommon for pupils to speak fluently on a given phase of the subject for fifteen or twenty minutes or even longer. The difficulty in this respect lies in getting pupils to confine themselves to their share of the time rather than in getting them to speak long enough. Unfortunately, the time available is utterly inadequate to permit any one pupil to discuss the topic at length.

On one occasion, when such an experiment was attempted, a pupil of more than ordinary ability spoke readily for thirty-five minutes; when she was stopped, on account of lack of time, she had covered barely half the topic. On another occasion the class was asked to prepare written recitations on the westward movement; they were told that they might write as long as they pleased. After they had written during the entire period for four consecutive days the instructor was compelled to stop the exercise although many of the pupils had not completed their discussion of the topic. As a general practice, of course, condensation of material during recitation is urged.

Time necessary for the mastery of a topic.—Although no time is set in advance for the completion of a topic, most of the units in the modern-history course require approximately four weeks for mastery. There are frequent variations in actual practice, but ordinarily the time in classroom periods (fifty minutes each) is distributed on a typical unit as shown in Table II.

Supplementary projects.—How are the more capable pupils taken care of so as to keep the group together? It is apparent that a pupil who—to refer to the schedule in Table II—is successful on his first presentation test and who completes his work in assimilation in ten periods, is six periods ahead of the group. What provision is made for him? A pupil of this sort, it may be said, has with rare exceptions unusual aptitude or liking for history. During the assimilation period he finds, as a rule, subjects related to the main unit which arouse his curiosity and interest but which are not included in the minimal essentials. When he gets ahead of the group in the required work he has a chance to follow up this intellectual interest. If he has no such interest, the situation affords the teacher an opportunity or challenge to develop it.

TABLE II

	Number of Periods
1. Exploration	1
2. Presentation (and questions by the class)	2
3. Assimilation	15
4. Organization	1
5. Recitation	3
Total	22

Supplementary projects, in fact, have as their chief *raison d'être* the creation and stimulation of genuine intellectual interests. In more than one instance pupils whose attitude toward the required work of the course has been at best that of good-natured tolerance or acquiescence have been awakened to an enthusiasm for history by a thorough study of some such supplementary project as "The Education of Napoleon," "The Gold Rush to California," "The Underground Railway," "The Invention of the Reaper," "The Religious Beliefs of the Slaves," "The Agricultural Revolution," or "Early Socialistic Experiments." While supplementary topics are usually placed on the guidance sheets, the most successful projects are those which originate with the pupils. As a rule, a completed supplementary enterprise takes the form of a thoroughgoing well-written paper supplied with footnotes and bibliography.

If a comparison is made between the plan described and the method followed by many successful workers in the world of affairs, certain important similarities will be discovered. In a general way, the man of intelligence who has a job to do—whether it be the writing of a book or the building of a skyscraper—usually begins the undertaking by asking himself consciously or subconsciously what he knows about it or what his resources are (exploration); in the second place, he generally attempts to block out the task or to sketch it in the rough (presentation); his next task is to assemble his material (assimilation); he now formulates his final plans (organization); and, lastly, he puts his work in finished form (recitation). If this analysis is correct, it would seem to follow that the method of instruction herein described is a mode of procedure which is frequently found effective in the workaday world. If so, it is adapted, not only to enable boys and girls to master useful historical information, but to inculcate in them a method of work which they will find useful in later life in attacking and solving contemporary political, social, and industrial problems.

THE DEVELOPMENT OF A CURRICULUM IN CORRELATED MATHEMATICS AND DISCUSSION OF AIMS VALUES, AND RESULTS

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Principal criticisms of courses in algebra and geometry as traditionally taught.—The mathematical subjects were among the first to be admitted to the high-school curriculum. For a long period their position was considered secure and well established. They were able to retain this position because of their supposedly great mental training value and because of the usefulness of mathematics. More recently, when the newer subjects—the sciences, arts, commercial studies, and others—began to compete with the older subjects for places in the curriculum, the security of position of the older and well-established departments was endangered. When schools began to make scientific studies of the results of teaching, and when it was found that an abnormally large number of pupils failed to profit sufficiently from a number of the traditional studies to make passing grades, dissatisfaction with such courses and with the methods of teaching them continued to grow. Indeed, this dissatisfaction is one of the striking features of modern teaching.

The mathematics courses have received their share of criticism, both as to content and as to method. Teachers of mathematics have not been indifferent to these criticisms. Their leaders have long recognized that no subject in the curriculum can remain static when the whole system of school organization is undergoing a transformation. For the last twenty-five years there has been considerable activity to bring about improvements. Reforms have been advocated and made, which have influenced the teaching of mathematics throughout the world. Each of these movements has aimed to correct shortcomings pointed out by one or several of the main criticisms. Each was received enthusiastically, was discussed widely in journals and at teachers' conferences, and left its mark on committee reports and textbooks, only to give way to the next movement which was to be the center of discussion for a few of the succeeding years.

If one compares textbooks in first-year algebra and in geometry of today with those of twenty-five years ago, one cannot help but see the effect of these reform movements on the selection of subject-matter and methods of treatment; though no radical reconstruction has taken place. As a result, we find that school officials who are intrusted with the task of selecting courses of study for the pupil are as much as ever against a year's course in algebra and a year's course in demonstrative geometry as required subjects for graduation from the high school. They consider the changes that have been made in these courses during the last thirty years as insignificant compared with the tremendous changes in modern school organization and contemporary civilization.

Many individual high schools have dropped mathematics as a required subject. In Ohio the Department of Education has ruled that a unit of mathematics will no longer be required of approved high schools. In other states the desirability of taking similar action is being considered. These are facts which cannot be overlooked. Those teachers who believe in the aims, purposes, and values of secondary mathematics and who are convinced that it is highly desirable for all young people to get acquainted at least with a beginning course in mathematics, are doing the cause harm when they insist that this unit be a year's work in algebra or in geometry of the traditional type. School officials who decide for the pupils what courses they are to take are being converted in increasingly large numbers to the belief that these courses are "out of keeping with the legitimate demands of the time."

The omission of mathematics in the pupil's education is little short of a calamity. The study of certain phases of mathematics deserves an important place in a liberal education. Modern thought and enterprise are steadily increasing in mathematical precision as is apparent in the application of statistical methods to studies in the biological sciences and the sciences of human nature. To understand modern civilization in many of its aspects one must be able to appreciate its precise quantitative character. One must be able to read intelligently quantitative accounts of modern enterprises. Familiarity with modern methods of measurement and skill in doing quantitative thinking are essential. Without mathematics we shall fail to prepare the pupil to understand discussions pertaining to the quantitative aspects of civilization.

Omitting all criticisms concerned with the method of teaching, the following have been quoted frequently in order to show that there is need for a reorganization of the traditional curriculum in mathematics.

1. The subjects of algebra and demonstrative geometry contain many abstractions that are too difficult for the beginner.

2. The applications of arithmetic, algebra, and geometry do not interest the pupils because they lie outside of their experiences.

3. The major part of the content of high-school mathematics courses is mainly a matter of symbols, dogmatic definitions, arbitrary rules, and meaningless manipulations.

4. The subject-matter, having been brought down from the upper schools into the high school, has not been adapted to the pupils' mental ability. Pupils who lose their hold on the subject during the first few weeks usually fail to understand the remainder of the course.

5. The arrangement is largely logical, the psychological having been sacrificed to the logical.

6. The selection and organization of material have been influenced chiefly by entrance examinations or by remote needs in future courses in mathematics. Hence, the work does not fit the real needs encountered in the pupil's active life and in his other school subjects, not even his immediate needs in the study of mathematics.

7. The subject-matter has little social value and is not in keeping with the legitimate demands of the times.

8. Where only one unit of mathematics is required, this unit must be algebra, demonstrative geometry being too difficult as a first course. Accordingly, the pupil receives no training in space intuition before the third or fourth year of his high-school course when he takes up solid geometry, for the traditional course in geometry is more a course in logic than in space relations. Furthermore, the simple but fundamental and exceedingly valuable notions of the upper courses are kept from the pupil. Only those who specialize in mathematics get acquainted with the fundamental notions of trigonometry, analytics, and calculus.

9. American pupils lose from one to two years of time studying secondary-school mathematics as compared with pupils of the same age in the schools in Europe.

10. Notwithstanding this disparity in time, progress in the separate courses is too rapid. Before having gained firm grasp of new concepts, the pupil is expected to make intelligent use of them in difficult operations and in logical demonstrations.

11. Pupils cannot use their mathematics. Teachers of subjects other than mathematics complain that pupils do not know how to apply the mathematics they have learned. College teachers report that students are not well grounded in the fundamentals.

These are the staple criticims commonly held and expressed by school officials in responsible relations to the pupils' school careers.

They strike at the fundamentals in mathematical education. It is possible to meet these criticisms only by thorough reorganization of the old-line courses. Mere removal of relatively slight imperfections will not suffice.

Important reform movements aiming to improve the curriculum in secondary-school mathematics.—Criticisms coming from outsiders are, as a rule, destructive. They are, however, suggestive and raise definite questions and problems for the teacher of the subject which is criticized. Indeed, curriculum-makers, textbook writers, and teachers are always working to find solutions of these problems. Reforms have come largely from within, i.e., from the teachers themselves. The scope and results of these reforms and efforts to get results are usually not known and not appreciated by those outside of the departments concerned. Progress may be slow, but progress is being made. In listening to the discussions at the meetings of the National Council of Teachers of Mathematics which were held in Chicago during February, 1922, one could not help being impressed with the fact that statements which five years ago would have been attacked as extremely radical went unchallenged and were accepted as sound. The following are some of the important movements of the last twenty-five years, aiming to solve the problem of reconstructing the mathematical curriculum. Present tendencies are largely outcomes of these earlier efforts.

1. *The Perry movement.*[1]—During the years 1900 to 1902 Perry delivered a number of lectures in England on the teaching of mathematics. He advocated the placing of steady emphasis on the practical sides of mathematics, especially mechanical drawing, problems of physics, chemistry and engineering, and graphical methods. These views were received with enthusiasm by the teachers in America. Much was to be gained by connecting mathematics with subjects of interest to the boys. Furthermore, the introduction of material from other subjects promised to reduce formalism in the instruction. A number of papers have been published showing how to correlate closely the work in mathematics with physics and the other sciences. An extreme attitude was assumed by those who advocated that the formal study of mathematics be abandoned completely and that the subject be developed "incidentally" through applications in other subjects. One direct outcome of the Perry movement was the appearance of textbooks with numerous applications. In the teaching

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[1] *Educational Review*, XXIII (1902), 158–81; *Nature*, LXII (1903), 317; *Discussion on the Teaching of Mathematics*, edited by John Perry (New York: Macmillan Co., 1901).

much emphasis was given to these applications. Although later experience showed that many of these so-called real or practical applications were not as real to the pupils, especially to the girls, as some of the traditional problems which they replaced, the influence of the Perry movement left its mark in the content of secondary-school mathematics not only in England and America, but also in France and Germany.

2. *The movement for concrete mathematics.*—Teachers in France, Germany, England, and America urged strongly the replacing of the abstract by the concrete. Abstract relations should be derived from concrete experiences. Intellectual achievement and material thoroughly understood and mastered by the pupil should be the basis for future work. The practice of beginning a course with pages of definitions and axioms to be followed by proofs of theorems was declared as of doubtful value. The effect of this movement was felt mostly in geometry where it has led to the experimental and laboratory methods and to the admission of a larger number of fundamental assumptions than commonly found in texts using Euclid as a basis. In algebra the movement brought about the introduction of much geometrical material in order to make concrete abstract laws and processes.

3. *The Klein movement.*[1]—A movement was started by Professor Klein of Germany. Perhaps no one in Germany has influenced American mathematics as much as Klein, who was the representative of the university interests for the Prussian government at the World's Fair (1893) and president of the International Commission on the Teaching of Mathematics in 1908. Klein's suggestion was to make the function concept the unifying idea in both algebra and geometry, insist on psychological arrangement, combine plane and solid geometry, and join algebra and geometry.

4. *The Tannery-Borel movement.*[2]—Tannery and Borel advised the replacing of some of the objectionable proofs of solid geometry by common-sense discussions based on models, bringing into secondary courses some of the elementary notions of differential and integral calculus, and introducing the elements of analytic geometry. This should open a world of ideas to the pupil and should make possible a multitude of applications.

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[1] *Ueber den Math. Unterricht d. höh. Schulen. Jahresbericht D. Deutsch. Math. Verein* (1902), pp. 128–40.

[2] J. Tannery, "L'enseignement Géométrie," *Revue Pedagogique*, XLIII (July, 1903), 1–27; J. Tannery, *Notions de Mathematiques* (Paris: Ch. Delagrave, 1903); E. Borel, *Algèbre, Second Cycle*, Paris (1903).

5. *The movement of correlating mathematical subjects.*—In his now famous presidential address[1] before the American Mathematical Society, Professor Moore, head of the Department of Mathematics, of the University of Chicago, frankly suggested the breaking-down of the traditional curriculum. He advocated the abolition of "water-tight compartments" by which arithmetic is taught in one compartment, algebra in another, geometry in another, and trigonometry in another; and presented vigorously the contention that mathematics be taught as one subject, each division helping and illuminating the other. This movement might be considered as the logical outcome of all of the preceding movements. While each of these aimed to correct only certain particular shortcomings, or to remove only certain objectionable features, it is probable that through correlation we may arrive at a real solution of the problem of constructing a satisfactory curriculum.

6. *The testing movement and the movement of elimination.*—With the development of scientific methods in education has come an increasing amount of testing of subject-matter. In the near future much will be learned from it about the relative difficulties involved in the study of typical parts of mathematics. The result will be the elimination, or the postponement to a later stage, of much of the material now taught in the lower courses. It is altogether possible that much of the work now taught in the upper courses will be brought down. The new modern courses will not be made up on the basis of tradition or opinion, and the material used will be defensible on the basis of definite principles.

Historical sketch of the development of a curriculum in correlated mathematics at the University of Chicago.—Experimentation with curriculum construction began in 1903. Since at that time there were none but traditional textbooks available, the teachers undertook to use the plan of simultaneous teaching of algebra and geometry. This is being used successfully in the schools of Germany and has been advocated by leading men in this country.[2] It was decided to teach during one semester algebra on three days and geometry on the remaining two days. During the following semester algebra was to be taught two days and geometry the remaining three days. A similar plan was to be followed in the third-year course with algebra and trigonometry alternating. Although the plan was given a good trial, it was not a success. Neither teachers nor pupils liked it. The use of two textbooks was disturbing to the pupils. They were constantly confused as to the right assignments for the day, and they were annoyed by the frequent abrupt changes from one subject to another. The teachers found that with each change from either subject to the other some time had to be spent on reviewing and that each time considerable effort was needed to work up new interest. The principal benefits which came from this experiment were the discovery of many opportunities for correlating the two subjects, the feeling developed among the pupils that they were being held responsible for both subjects as long as they were studying mathematics, and the advantages derived by keeping algebra and geometry in constant review. It became apparent that the solution of the difficulties was to be sought in a systematic arrangement of the mathematical subjects in one single course.

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[1] E. H. Moore, "The Foundations of Mathematics," *Science*, XVII (March 13, 1903), 401–16.

[2] J. W. A. Young, *The Teaching of Mathematics*, p. 183. New York: Longmans, Green & Co., 1909.

In the school years 1903–5 a tentative program for mathematics along the lines of correlation was worked out in conferences of the teachers of mathematics of the College and the High School of the School of Education, Professor George W. Myers acting as the chairman. The tentative course thus prepared was used in mimeographed form in 1905–6. The material was revised and published by the High School in the summer of 1906 under the title *First-Year Mathematics for Secondary Schools*. The printed book was intended for use in the University High School, but other schools having become interested asked to be supplied with copies, though the book was still in tentative form. Since the High School office was unable to satisfy these demands, the University of Chicago Press took over the publication of the course.

The next step in this early experimentation with correlation was a little manual, *Geometric Exercises for Algebraic Solution*, published by the University of Chicago Press in the summer of 1907. It offered numerous opportunities to the teachers of traditional courses in geometry to correlate the work with algebra. At this time there was considerable discussion among teachers regarding the dangers of introducing algebraic material in textbooks in geometry. There were many who advocated the use of separate textbooks and who believed that the best results could be accomplished by that plan. *Geometric Exercises* was expected to fill a real need, and the teachers worked on this book with enthusiasm. However, there was practically no sale. This disappointing experience further emphasized the difficulty involved in having two textbooks in one course. The busy teacher cannot find the time to work out a plan of using two books simultaneously. What he or she needs is one textbook in which the correlation is worked out in some systematic way and which may be followed without disturbing the order of arrangement. It was decided to continue the plan of correlating the course in a single book for each year, and in the spring of 1910 the University of Chicago Press published *Second-Year Mathematics* in tentative form.

This completes the first stage in the process of working out a mathematical program along the lines of correlation. The first problem had been to discover ways of correlating the various mathematical subjects. The next step was to improve the books by a better psychological arrangement and by changing methods of presentation, i.e., to make them more easily teachable. Classroom experience resulting from the watching of pupils at study, the watching of teachers present the material to their classes, and the studying of the results of departmental tests, has led to a complete revision of the series. The result has been a new series of four books, each intended to furnish a year's work.[1] Upon completion of the first three books the pupil has fulfilled more than the most exacting college requirements. The four books together include all of the mathematics of the senior high school and junior college and prepare the student to take up calculus as the next course in mathematics.

For the last three years the department of mathematics has been organizing courses for the first year of the junior high school. The advantage of correlating the subjects taught during this period is now generally recognized as the best method by which the pupil of junior high school age can gain a broad understanding of secondary-school mathematics. The experiment has convinced the department that enough can be accomplished in two years of junior high school mathematics to form a sufficient requirement for the great mass of pupils, and that those who wish to specialize in mathematics can receive in these two years a preparation good enough to enable them, within another year, to satisfy the ordinary college requirements. At the end of this year they are ready for junior-college mathematics. A series of junior high school textbooks embracing this plan is being prepared and is near the stage of completion.

It is gratifying to observe that in the junior college the idea of abandoning the "water-tight compartment" method is growing and that many of the textbooks which have appeared recently contain material organized along lines of unification.[2]

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[1] *First-Year Mathematics*, *Second-Year Mathematics*, *Third-Year Mathematics*, and *Correlated Mathematics for Junior Colleges*.

[2] "Junior College Mathematics," *School Review*, XXIX (November, 1921), 714–15.

With a growing tendency in the junior high school and in the junior college to bring the different branches of mathematics into closer touch, progress in the high school should be looked for along the same lines. In advocating the teaching of mathematical subjects in parallel courses, J. W. A. Young says, "The reasons for the failure to make the improvement seem to be those of inertia, of conservatism rather than a conviction that the change proposed is not good, or that the customary order is better. I know of no published defense of the traditional procedure, but still the old order which finds no defender in theory, persists in practice. . . . . To bring the different branches of mathematics into closer touch is not only the most feasible but also the most promising change possible in the secondary school curriculum in mathematics."[1]

Aims to be accomplished through a curriculum in correlated mathematics.—It has been pointed out that the traditional courses in secondary mathematics are open to serious criticism. Certain movements have aimed to remove the cause for one or several of these criticisms. Although the effect of these movements can be seen when one compares the textbooks of today with those of twenty-five years ago, the essential characteristics of the courses in algebra and geometry have remained the same. No real reconstruction has taken place, and the mathematical outcomes are as severely criticized now as before. In the correlation of mathematical subjects are offered unusual opportunities to find solutions of the problems raised by these criticisms. The following are some of the possibilities to be attained.

1. The method is well adapted to fit the subject to the needs of the pupils. Both algebra and geometry contribute to the intellectual life of the pupils. Students need them in other school studies, and both have social values. By introducing as phases of arithmetic the equation, literal numbers, and constructional geometry, and by postponing some of the algebra commonly taught in the first course to a later stage, it is possible to bring in topics from the other mathematical subjects. The pupil who takes only one year of mathematics can then be taught enough algebra to prefer the algebraic method of solving problems to the less effective arithmetic method and in addition acquire such fundamental geometric facts as he is likely to make use of in other studies, and more stress can be laid on the inclusion of topics which have social value, which can be understood by the pupil, and which are most essential to him in later life. He may become acquainted early with the fundamental

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[1] J. W. A. Young, *The Teaching of Mathematics*, pp. 184, 187.

notions of trigonometry as useful tools in problem-solving. He may receive training in both two and three dimensional thinking.

2. Correlation facilitates a psychological arrangement of subject-matter. The importance of developing a course which conforms with the mental development of the pupil cannot be overestimated. The success of any course depends largely on the extent to which this adaptation is made. This may be accomplished by bringing together at the beginning the simple principles of the various divisions of secondary mathematics and gradually leading up to the more complex aspects. Thus, the pupil studies at first only the linear functions of algebra. Very little algebra is needed in the solution of a large number of problems of the type usually found in algebra textbooks. At the same time he studies line-segments, simple angle relations, perimeters, and circumference of a circle. As a beginning of trigonometry he learns to solve problems of finding unknown distances by means of scale drawings and similar figures. He develops skill in the use of protractor, compass, and straight edge. The work may then be continued on a higher level with quadratic functions, areas of polygons and surfaces, and then with cubic functions and the volumes of the common solids.

3. Correlation satisfies the demand for concrete mathematics. Geometry furnishes the most available material to make concrete the abstract definitions, rules, and processes of algebra. Even the simplest elementary concepts of algebra should be made concrete. The most typical errors are due to lack of understanding of such simple terms as $2n$ and n^2 and $(a+b)^2$ because pupils do not have sufficient concrete experiences with them. For the same reason pupils have undue difficulties with transposition, the law of signs, and other fundamentals which, if not understood, amount only to symbol juggling without insight into the real meaning. In geometry the concrete is combined with the abstract, resulting in a better understanding and appealing to the pupil's interest.

4. Formalism is reduced. When the various mathematical subjects are treated separately each, very clearly, tends to take on the rigid form of the final science. This leads inevitably to a certain formalism in the mode of presentation, which is not the best method for the high-school pupil. This has given us textbooks beginning with pages of definitions and axioms and with the study of single topics carried far beyond the point of need. Thus, many types of complicated equations studied in first-year algebra texts do not occur in the solution of problems found in the same book. For the same reason there is practically no

need for most of the factoring. The study of these topics should be postponed to a later stage when they can be mastered with less effort on the part of both teachers and pupils and in less time.

5. Correlation allows sufficient time to develop mathematical abilities. The origin of mathematics is found in the practical needs of the ancient peoples. The race became familiar with geometry through experimentation and measurement. It took over 2,000 years, from the time of the Babylonians to the time of Plato, to learn that geometric facts may be established by processes of reasoning. From this we learn the lesson for the teaching of geometry that in the beginning for a long time, perhaps a year, the emphasis should be on intuition, observation, classification, description, measurement. Gradually the pupil may begin to use informal reasoning. After this period explicit training in demonstrative geometry may follow. Disregarding the need for sufficient time to develop abilities, the traditional courses rush the pupil through one subject under great pressure. During this time all other subjects are excluded, as if either might be contaminated by the other. The principal aim is to "get through," to pass an examination, and then to drop it. This method may be a success in training to pass examinations, but it does not allow for real assimilation, nor will it develop thought power in the fullest measure.

> A youth who learns first arithmetic, then algebra and then geometry, and who keeps on this way for ten years will have his mental powers less strengthened than by three or four years of parallel instruction, intelligently conducted.[1]

In algebra, processes which logically belong together but present real difficulty for the beginner may be separated in treatment. Thus, before studying the law of signs and the operations with positive and negative numbers, the pupil should have developed ability to operate with unsigned literal numbers.

6. Correlation aids understanding. Each subject is reinforced by the aid of the others. For example, algebra and geometry supplement each other. Both are used to express facts about quantity. The formula, the table, and the graph are only different ways of expressing the law of a group of numerical facts. When the two forms of thought are correlated in a single course of instruction, the student's comprehension of quantity is deepened and simplified. With clear understanding comes increased interest. On the other hand, no matter how useful a subject may be,

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[1] Charles Ange Laisant, *La Mathématique*, p. 227. Paris: Carrée et Naud, 1898.

if the pupil cannot understand it, he loses interest. Objections of children to mathematics cease as soon as they understand the work.

7. Functional relations receive the emphasis they deserve. The idea of relationships can be kept predominant in the minds of the pupils. In arithmetic, cost, interest, and percentage are functions, respectively, of the number of articles, time, and base. The graph pictures the relation between two variables expressed by an equation. The symbols x and y in an equation are no longer looked upon as fixed unknown numbers, but as variables. Perimeters, areas, arcs, and angles are all functions of variables, the functional relations being expressed by formulas and equations. In this manner functional correspondence and functional thinking are constantly being emphasized. Without study of the function, its geometrical representation showing how number and space illustrate each other, how algebra and geometry aid each other, there can be no real appreciation of the meaning of mathematics.

8. Correlation saves time. This saving should not be effected at a loss to the pupil. Time is to be saved through psychological arrangement of subject-matter; by postponing the teaching of processes, which in the early period can be mastered only with great effort on the part of teacher and pupil, to a later stage when need for them arises; by keeping the various subjects in constant use, thus avoiding needless reviews; through mastery due to real understanding, interest, and enthusiasm; and because ability and success in one subject inculcate confidence in another.

Results attained by pupils studying mathematics at the University High School.—The following questions are usually asked by teachers, supervisors, administrators, or others who are considering a change from traditional courses in high-school mathematics to a correlation of the mathematical subjects. What has been the effect of the new course at the University High School on the percentage of failures? How much mathematics is required? What is the attitude of the pupils toward the course? What has been the influence on the registration? Is the same or more subject-matter covered within a definite period of time? Do the pupils make as good a showing in standardized tests as those taught in the traditional courses? Are the pupils successful in college mathematics? Can the course be mastered by the ordinary high-school pupil, or is this possible only for selected groups of pupils? Does it require especially trained teachers to teach correlated mathematics?

Since these questions indicate the points of general interest, the practical success of the correlated course can be judged from the answers to them. For convenience, the questions may be divided into three classes: first, those referring to the attainments of pupils within the school; second, those which call for information on results exhibited after the pupils leave the school; and third, those which are concerned with the introduction of these courses in other schools. We shall begin with a discussion of attainments within the University High School.

1. *Percentages of failures.*—Complete records of grades given in the University High School are available for the years 1911 to 1915 and for 1920. It appears that at the time the department of mathematics undertook to work out a new curriculum there was a larger percentage of failures in mathematics than in any other department in the school. However, as the new courses were introduced, the difference between the percentage of failures in mathematics and those in the school as a whole diminished each year until in 1920–21 the percentage for mathematics was actually less than that for the school. It cannot be claimed that this reduction of failures in mathematics was brought about entirely by the reorganization of the courses. Apparently, while the organization of the school was being improved, every department received a share of the benefits derived from these improvements. However, with the development of the new courses the percentage of failures was reduced more rapidly in mathematics than in the average for the school as a whole.

2. *Failures and withdrawals.*—The early High School records show nearly as large a percentage of withdrawals from courses as failures. Indeed, many of these withdrawals occurred when pupils dropped courses to avoid certain failure. A study of withdrawals is, therefore, as significant as a study of failures. As in the case of failures, the reduction of failures and withdrawals took place more rapidly in mathematics than in the school as a whole. At first a larger percentage of pupils withdrew or failed in mathematics than in any other department in the school. This was still true in 1912 and 1913, although the percentage had decreased. In 1914–15, for the first time, the department of mathematics had a smaller percentage of failures than one of the other departments; in 1915–16 it had a smaller percentage than three other departments; and in 1920 it occupied a median position among the departments of the school.

3. *Registration in mathematics.*—Most of the pupils who enter the University High School plan to go to college. To them it makes little difference what the mathematical requirements for graduation from the high school are, as they must complete from two to three years of mathe-

matics before entering a university. A large registration in mathematics, therefore, cannot be considered a valid measure of results. Several years ago, when the school lowered the graduation requirements from two years of mathematics to one year, there was no noticeable effect on the registrations in mathematics. Throughout the last ten years the percentage of pupils who study mathematics has been practically constant, about 75 per cent of the enrolment. This year 386 of the 520 pupils in the school are taking mathematics. One significant feature is the increasing number of pupils who take the third- and fourth-year courses. This year ninety pupils are studying third-year mathematics and twenty-four fourth-year mathematics. In view of the fact that many pupils cannot elect courses in the Senior year because they must satisfy college requirements in other subjects, this is a good showing for a school of the size of the University High School.

The tendency in education is to put all subjects on an elective basis but to require that a certain number of sequences be completed in the elected courses. If the University High School should decide to adopt this policy in the near future, it is hoped that the features so objectionable in the traditional method have been eliminated to such an extent that there will be no falling off in registration in mathematics.

4. *Economy of time.*—Compared with the results attained in the schools of Europe, the traditional system of teaching mathematics in this country is wasteful as to time. The correlation of mathematical subjects makes it possible to eliminate, or at least to diminish, the disparity. Expressed in terms of the traditional units, the amount of mathematics covered in the three years of the junior high school of the School of Education is equivalent to 1.5 units of algebra and 1 unit of geometry. The first-year course is a general course required of all pupils. This is the only requirement for graduation. It emphasizes social values, the informational side of geometry, and the use of the ruler and compass in constructions and designs. In the applications of arithmetic the uses of algebraic formulas and equations have replaced the wasteful arithmetical methods. The work of the second year is based on that of the first year. Indeed, the three-year course is continuous in order that there shall be no loss to those pupils who elect mathematics after the first year. Part of the third-year course is the study of the trigonometric ratios of angles less than 360°, the solution of geometric problems by means of the right triangle, and a study of the graphs of the trigonometric functions. Thus, at the close of the junior high school period, pupils are prepared to specialize in mathematics.

Pupils who enter the senior high school on completion of the eighth grade in the city schools master in four years the equivalent of the usual high-school mathematics plus one year of junior-college mathematics. They are then prepared to take up the study of calculus as the next course in mathematics in the Freshman year in college.

This saving of time has been effected by keeping arithmetic, algebra, and geometry in constant use, by holding the pupil responsible at all times for what he has learned in all of these subjects, and by using algebraic methods in place of the usual arithmetic methods in solving problems. The greatest waste in the teaching of mathematics is ordinarily in the seventh and eighth grades. For example, in these grades considerable time is spent on drill and review of the fundamental operations intended to secure a high degree of proficiency and on applications which the pupil fails to understand because they lie outside of his experiences. The results of standardized tests tend to show that this proficiency can be secured equally well through applications. Thus, in the seventh and eighth grades of the junior high school of the School of Education no formal drill in the fundamental operations is given, but arithmetic is in constant use in connection with problems in geometry, algebra, and business applications. At the end of the first school month, on November 4, 1921, the Cleveland Survey Arithmetic Tests were administered to pupils of the junior high school. Five months later the tests were given a second time. In scoring the tests the weights given by Counts[1] for the problems of the fifteen different component tests were used, and the total score was taken to represent the pupil's computational skill. Forty-four eighth-grade pupils who took the test both times made an average gain of 44.7 points, which is a good showing when compared with the standard average gain of 36.4 points for pupils during the eighth grade.

Results attained in the University of Chicago by pupils who have studied mathematics at the University High School.—During the years 1919–20 and 1920–21, eighteen University High School graduates elected mathematics as one of their studies at the University of Chicago. Marks at the University are expressed in terms of grade-points, and on the report of a student's grade the average grade of the class is also given. The relation between the usual marking system and grade-points is stated in Table I.

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[1] George S. Counts, *Arithmetic Tests and Studies in the Psychology of Arithmetic*, p. 28. Supplementary Educational Monographs, Vol. I, No. 4. Chicago: University of Chicago Press, 1917.

The grades in mathematics for the eighteen students are reported in Table II. This table shows that in both years the University High School students made an average number of grade-points which was above the class average. Fourteen students made grades higher than the average in their respective classes, and four fell below the average. There were no failures or conditions.

TABLE I

THE UNIVERSITY OF CHICAGO MARKING SYSTEM

	Mark	Number of Grade-Points
Excellent	A A−	6 5
Good	B B−	4 3
Fair	C C−	2 1
Barely passed	D	0
Condition	E	−1
Failure	F	−2

TABLE II

COMPARISON OF GRADE-POINTS MADE BY EIGHTEEN STUDENTS WITH THE CLASS AVERAGES IN MATHEMATICS

	1919–20	1920–21
Number of students	10	8
Average number of grade-points per student	3.6	3.9
Average number of grade-points per student in class	2.2	3.02
Ratio of averages	1.63	1.29

It may be thought that the explanation of this favorable showing is to be found not so much in former training in mathematics as in the superior native ability of these students. In that case they should show superiority in the other subjects taken at the same time.

The subjects taken besides mathematics and the number of grades reported in each are as follows: English 9, Latin 4, Greek 1, Romance 3, history 2, political economy 1, history of art 1, physics 3, chemistry 6, geology 3, and botany 1. The grade-points and class averages in these subjects are shown in Table III. It is seen that in subjects other than mathematics the 1919–20 pupils stood above average and that the 1920–21 students were below average. However, in mathematics the 1920–21 group made as good a record as the 1919–20 group.

Dividing the grade of each student by the class average, the total of these quotients is 17.13 for mathematics and 12.46 for the other subjects for the 1919–20 class. The ratio of these totals is 1.38 in favor of mathematics. For the 1920–21 class these totals are 10.08 and 7.48 with a ratio equal to 1.34 in favor of mathematics. There were no failures. Thus, if teachers' marks are taken as a measure of student attainment, the students who studied mathematics in the University High School and who elected mathematics in the University of Chicago have a record of achievement in mathematics uniformly higher than the class averages in mathematics, and only now and then higher than the class averages in the other subjects taken at the same time.

TABLE III

COMPARISON OF GRADE-POINTS MADE BY EIGHTEEN STUDENTS WITH THE CLASS AVERAGES IN SUBJECTS OTHER THAN MATHEMATICS

	1919–20	1920–21
Number of students	10	8
Average number of grade-points per student	3.75	2.2
Average number of grade-points per student in class	3.02	3.13
Ratio of averages	1.24	.94

In the Autumn Quarter of 1921 the Department of Mathematics of the University of Chicago decided to accept as the equivalent of one year of junior-college mathematics, without examination, the fourth-year course given at the University High School. Four of last year's graduates, two boys and two girls, availed themselves of the opportunity to elect calculus in the Freshman year. The individual records of these students for the first quarter are included in Table IV. No class averages were reported in these courses, but it is apparent that their records in calculus are high and at least as good as in the other courses.

Attainments in other universities and colleges.—A circular letter was sent to all institutions to which certificates had been mailed for the graduates of the classes of 1919 and 1920. The following information was asked for in this letter.

1. The subjects studied during the term (semester) in which the first course in mathematics was taken during the Freshman year.
2. The grade received for each subject.
3. The class averages.
4. The rank of each student in his classes.

Replies were received from the following institutions. The figures indicate the number of students reported on. University of Alabama 1, Amherst College 1, Armour Institute 1, Cornell University 1, Dartmouth College 2, University of Illinois 3, University of Michigan 5, University of Notre Dame 1, Oberlin College 1, Smith College 3, Vassar College 4, Wellesley College 2, University of Wisconsin 4, Williams College 1.

TABLE IV

RECORDS OF FOUR STUDENTS AT THE UNIVERSITY OF CHICAGO TAKING CALCULUS DURING THE FIRST QUARTER OF THE FRESHMAN YEAR

	Grade	Credit
Student 1 (boy):		
Early Medieval Europe	B	1 major
Calculus	B	1 major
Elementary General Inorganic Chemistry, 1	A	1 major
Student 2 (girl):		
Rhetoric and Composition	A−	1 major
Calculus	B	1 major
Elementary Physics, 1	B	1 major
Student 3 (girl):		
Advanced French	B−	1 major
Shakespeare: Representative Plays	C	1 major
Calculus	B	1 major
Student 4 (boy):		
Calculus	A	1 major
General Inorganic Chemistry, 2S	B	1 major
Rhetoric and Composition	B−	½ major
Fundamentals of Military Science	C−	1 major

Since most of these colleges use letters to denote grades in their marking systems and keep no record of class averages, close comparisons like those made for the University of Chicago students are not possible. However, one can tell from the letters whether the student's grade in mathematics is approximately less than, equal to, or greater than the average of his grades in the other subjects. It was found that for eight of the thirty students the grade in mathematics was below this average; for six students it was the same as the average; and for sixteen it was above the average. The fact that eight stood lower in mathematics than in other subjects does not mean that they all did work of inferior type. Two of them received a B grade, one a B−, one a C+, and four a C. The distribution of grades in mathematics for the thirty students is as follows: A, 6; B, 11; and C, 13.

Using this study of grades as a basis for measuring attainment, it may be said that pupils who studied the correlation type of mathematics in the University High School have been able to succeed in the study of mathematics in college better than the average student and that the quality of the work done in mathematics has been above the average in the other subjects.

The problem of reforming the mathematical curriculum in other schools.—Although for many years serious objections to the traditional courses in mathematics have been voiced by administrators, writers, committees, and associations, and although valid reasons in favor of changing the procedure have been advanced, schools have been slow to readjust their mathematical work. This is not because the suggested changes are considered too radical, nor because the advantages to be derived are questioned, but largely because single schools hesitate to act independently in an important reform movement. However, there are many who are ready to make the reform but who have serious doubts as to the final outcome. Some express fear that the average teacher may not be able to teach the new material as successfully as the old. It is true that the large amount of measuring, drawing, and laboratory work which is found in these new courses can be done best in the classroom under the direction of the teacher and that teachers must introduce considerable directed study and modify the home-work–recitation plan. This means for many a change in the methods of instruction which is not always easy to make. The content, however, differs from that of the traditional courses mainly in the arrangement. Some of the subject-matter has been moved down from the upper courses, but one need not hesitate to introduce the fundamental notions of trigonometry in the junior high school or those of calculus in the senior high school. To the pupil they are far simpler than many things commonly taught in the first two years, e.g., some of the tedious and complicated demonstrations found in geometry, which after all are of no general value, each serving only the immediate purpose of proving one particular fact, and factoring in algebra, for which there is no real need in the first two years.

Frequently the opinion is expressed that the average pupil may not be able to master this new material as well as the old. As a matter of fact, these new courses are now being taught successfully in schools representing all types, by experienced teachers as well as by those who are new in the profession, in private and in public schools. Some of the preliminary results of an unpublished statistical investigation being carried on by a graduate student at the University of Chicago and which involves various types of schools tend to show superiority of courses in correlated mathematics over the traditional courses when comparable schools are studied.

Questions are asked frequently as to the period during which general or unified mathematics should be taught and as to the necessity of bringing the pupil who intends to specialize in mathematics back to the study of the separate subjects after the first year. In the attempt to answer these questions it is to be noted that mathematics aims to train certain fundamental powers important for all pupils whether they go to college, specialize in mathematics, or leave school to enter active life. One year of mathematics is desirable to test a pupil's inclinations. This year should make him acquainted with various phases of the subject, that is, with mathematics in general. However, this one-year course must be such that those who decide to continue the subject suffer no loss in time or training. Hence, each of the following courses must assume and use the subject-matter and methods acquired in the preceding courses. If a year's course in correlated mathematics is followed by traditional courses in algebra and geometry, the time saved in the first year through the correlation will be lost later because in the conventional courses there will be much needless repetition of subject-matter taught in the first-year course.

SUMMARY

1. This section of the monograph describes an experiment in reorganizing and reconstructing the content of secondary-school mathematics along the lines of correlation.

2. The traditional procedure is open to the most serious criticisms which call for a real reform in keeping with the legitimate demands of the time.

3. Teachers of mathematics have not been indifferent to these criticisms. The result has been a number of far-reaching movements aiming to improve the mathematical curriculum.

4. The correlation of mathematical subjects is an outcome of these movements and embodies all of the advantages advocated by them: adaptation to the needs of the pupil; introduction of the equation, literal numbers, and geometric construction as phases of arithmetic; psychological arrangement; concreteness; reduction of formalism; gradual development of mathematical abilities; better understanding; and emphasis on functional relations.

5. The experiment has resulted in a considerable saving of time for the pupils, especially in junior high school mathematics. This has been accomplished without loss to the pupil or the department.

6. The following results have been attained: the registration in mathematics has not decreased. The percentage of failures has been

reduced more rapidly than for the school as a whole. Reports from fifteen colleges show that University High School graduates who elect mathematics in college do better on the average in mathematics than in the other subjects. Through a study of the class averages it was shown that in the University of Chicago students from the University High School rank above the average in their classes in mathematics. Students who complete a year of junior-college mathematics in the University High School are able to do work of good quality in courses in calculus taken in the Freshman year of college.

7. Preliminary results of an investigation now under way indicate superiority of students who studied correlated mathematics in the high school over those who have taken traditional courses.

8. It is possible to develop in five months in a junior high school course in correlated mathematics, without formal drill, an average gain in arithmetical skill greater than the standard ayerage gain for the corresponding grade of the elementary school.

9. The first-year course is intended for all pupils whether they plan to go to college or enter active life. However, this course also prepares those who intend to continue the study. A return to the traditional courses after the first would result in needless loss of time and effort.

ORGANIZATION AND TECHNIQUE OF A TEACHING UNIT IN ENGLISH CLASSICS

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The organization of a course in the classics of English literature for high-school people requires, first of all, a definition of the objectives to be served by the course. These objectives can best be presented in conjunction with some consideration of the quantity and the nature of the content. It is the general function of the English III–IV Classics course in the University High School to give the students an introduction to literature of the *belles lettres* type, considered as such, and limited in quantity to those specimens which the intellectual and emotional maturity of the pupils permits them to understand and to appreciate.

Literature of the type considered may well be presented as the artists' interpretation of life as distinguished from the more purely informational content of the physical, natural, or social sciences. Its purpose is not primarily instructional in the sense of providing a definite content to be learned. It serves rather to broaden the reader's horizon, deepen his spiritual experience, and enrich his whole life through a constructive rather than a dissipative employment of his leisure time. The scientist, on the one hand, analyzes and dissects, is interested in elements and elemental forces, regards life objectively and impersonally, and rules out emotion. The literary artist, on the other hand, sketches and paints views of life in more or less complete compounds of human experience, regards life subjectively and personally, and glories in the emotional reactions aroused by his work. The reader of *belles lettres* may, thus, vicariously, find fresh color and new meaning in his own experience and enrich intellectually and emotionally his whole life.

The objectives of our course have been formulated with these qualities of the content definitely in mind. It is proposed, first, to lead and guide the pupils through a fairly extensive field of worthy literary art, both classic and modern. This end is attained through general pupil-reading from the library tables in the classroom, guided by the pupils' own tastes and the sympathetic direction of the instructor. Second, an attempt is made to lead the pupils to an understanding and appreciation of representatives of each type of this literature through intensive study and interpretation by the instructor. This process is not simply an end in itself but also a key to fuller appreciation of other specimens of the same type read silently by the pupils. Instruction is not successful unless it supplies stimulation to such extended reading. Third, an effort is made to lead the pupils to develop inductively for themselves standards of literary judgment which may serve as guides and stimuli to further individual reading on their own initiative; in a word, to intellectualize or rationalize standards of taste.

To illustrate the application of these objectives to a teaching unit of the classics course as presented in the school year 1921–22 is the purpose of this article. For purposes of convenient administration, the content of the course was divided according to type of literary composition. The first unit was in drama, the second in oratory, the third in essay and biography, and the fourth in poetry. Units in the short story, the novel, comedy drama, and narrative poetry are presented in the course of the preceding year, since their content ordinarily requires less intellectual and emotional experience for its enjoyment and appreciation than that of the units reserved for this course.

The pupils enrolling in English III–IV Classics are divided for instruction into groups segregated by sex. The organization and techniques which are described were employed by the authors of this report with two sections of boys under their instruction. Each section numbered twenty-four boys, ranging in age from fifteen to eighteen years, and equipped with two years of previous training in English. We shall describe here in some detail the methods employed in stimulating and guiding these boys in general reading in the field of essay and biography, in arousing their appreciation and enjoyment of certain specimen selections from the type, and in cultivating in them a taste for, and some standards of literary judgment in, such reading.

The wide and varied range of the literary content of the unit in essay and biography may be readily appreciated through an examination of the actual pupil-reading record given in detail in the last section of this report. It will be found to include the informal or familiar essay, the more formal critical and biographical essays, personal journals and diaries, and formal biographies and autobiographies. The entire range of literary composition in this type in the English language from Francis Bacon to Christopher Morley found place on the book tables in the room devoted to the work of these students. The only limitations observed were those arising out of the immaturity of the pupil-mind, the physical limitations of book supply, and a careful regard for the literary worthiness of the selection.

Two very old words, *informal* and *inductive*, will serve to characterize the *how* of this teaching. They are, indeed, at the basis of all of the technique used in the English Department of the University High School. Each class is conducted in as informal a manner as possible, and the greater part of the teaching is done inductively. The following paragraphs will make these points clear.

The instructors are aided in keeping the informal tone by the size and arrangement of the room in which these classes are taught. It is nearly thirty-five feet square, well lighted by groups of windows on three sides. These groups of windows have comfortable window-seats which tempt the boys during their silent-reading periods. About the library tables at the back of the room on which the book supplies are stacked, the twenty-four boys may be seated easily. Two semicircles of chairs are grouped at the front of the room about the instructor's desk, arranged informally enough to permit the greatest freedom, yet formally enough to afford the instructor an opportunity to hold the attention of the class when necessary. The boys take these chairs on entering the room. As soon as the instructor asks them to do silent reading, they select a book from the table and find a comfortable place for work, either in a window-seat or at a table. Because of the convenience of this room, the instructors have been able to make use of a variety of procedures.

Since the boys in Classics III–IV were unfamiliar with essays of the whimsical and the reflective type and only a little acquainted with those of the biographical type, the first problem was one of advertisement. The instructors were faced with the question: Just how can essay material be most attractively presented to boys who have never read prose of the more serious sort and who probably are prejudiced against essays? The first answer to this question was found in much oral reading by the instructor at the beginning of the project. Sometimes a complete essay was read, sometimes short extracts from essays. The instructors were guided in their choice of such reading material by their own enthusiasm for certain selections and by their knowledge of the appeal of certain essays to boys between fifteen and eighteen years of age. Very often the selection was made with some particular boy in mind, e.g., Stevenson's *Inland Voyage* to catch a boy who had made a canoe trip down the Illinois River last summer, and Briggs's *College Life* for several who had the ethical attitude toward life and literature. This reading was not done to impart information and was therefore interrupted only for the briefest explanations of points not easily understood and for interpolation of personal anecdote or reaction that might increase the interest or appreciation. It continued as long as marked attention was shown—often for thirty minutes, seldom for a complete period. Among the readings were: Macaulay's *Life of Johnson*, read entire, with considerable attention to the author's style, selections from A. Edward Newton's *A Magnificent Farce* and *Amenities of Book Collecting*, Stevenson's *Inland Voyage*, Briggs's *College Life*, Pepys' *Diary*, Lamb's *Essays*, the *Sir Roger de Coverley Papers*, and current magazines. The part of the class period not used by the instructor for oral reading was spent by the class in silent reading from the books and magazines on the reading-tables.

After four days of such advertising on the part of the instructor and silent reading by the pupils, the first literary conversation was held. By a *literary conversation* is meant an open discussion in which every member of the class participates. It may be openly directed by the instructor on any topics introduced by the pupils, or it may be an apparently undirected conversation on some topic suggested by the instructor. The first of these was opened by the question: What have you discovered on the tables that has proved of interest? Naturally the range of interest was wide. By means of this discussion, the instructors discovered the strong appeals in individual cases and were able to suggest further essays for reading. A boy's remark about a book was often a challenge to another boy; thus the advertising continued, and much clear thinking was stimulated. Several of these literary conversations were held during the seven-week period occupied by the unit; some of these were definitely planned for, and some were the natural outgrowth of the formal reports described later.

Another type of literary conversation is one that might, for lack of a better name, be called a round-table discussion. The announcement of a round table by date and topic, several days ahead, afforded an opportunity for the boys to read something pertinent to the subject before the day set. In conducting this type of work, the instructor endeavored to remain in the background and to make the pupils feel a real responsibility for the discussion. The tables were placed in an L-shape. Seated about the tables, the instructor and the pupils talked about the topic informally. The instructors observed that there was very little tendency to shirk and that the interest was high. Some of the subjects used for the round-table days were "The Theater of the Eighteenth Century" (the interest in this was aroused by a life of David Garrick and by criticism of the plays of Sheridan and Goldsmith), "Landscape and Portrait Painting of the Eighteenth Century," "The Qualities of Great Biographies," and "Tendencies of Modern Essayists as Seen in Current Magazines."

The reading stimluated by the first literary conversation continued for the second week, broken each day through reading-advertisement by the instructor. At the end of that time the boys were ready for individual conferences with the instructor concerning topics for formal reports to the class. These conferences were held during the reading periods. As a rule, the instructors found that the boys had their subjects selected before the conferences began. In case a boy had not discovered a focus for his reading, he was helped to do so by questions concerning his interests; in no case were topics assigned. The reading periods for several days were increased in length and conducted as periods of directed study in which the instructors guided the gathering of material about the topic selected and its organization. This work was highly individualized. As soon as a boy's report was ready, he notified the instructor and a date was set for his floor-talk. He continued his reading of essays, but no longer held himself to his own topic.

Two of these floor-talks were given each day until all were completed. Sometimes they were long enough to fill the period; usually, however, the boys had from ten to fifteen minutes each day for reading. These reports were not essentially different from the usual oral composition. The instructors insisted on much reaction of the personal type; the boys were encouraged to talk about the essays in terms of their own appreciation and experience. They gave very little content and much critical analysis of the author's attitude, his approach to his subject, and the qualities of his style. They read selections to prove all of their points; in fact, they were allowed to make no statement for which they could not furnish specific evidence. They were prepared to answer any challenge made by a member of the class. The following list of subjects will show the quality of the thinking that went into these reports:

A Comparison of Innes and the Artists of the Eighteenth Century (the preparation of this report included a visit to the Innes room of the Chicago Art Institute)
Manners and Customs of the Eighteenth Century as Seen in *The Spectator*
The Genesis of Journalism
Mrs. Thrale
Johnson's *Life of Savage*
The Learned Ladies of the Eighteenth Century Compared with Dr. Anna Shaw and Others of Today

E. H. Sothern and David Garrick
World-War Issues and Ideals
Life in Samoa as Seen in Stevenson's Letters
Comparison of Eighteenth-Century Oratory and That of Today
Memoirs of Tennyson and Boswell's *Johnson*
Joseph Addison
Justice in the Law Courts (*Trial of Warren Hastings* and *The Beast*)
John Ruskin
Lamb's *Essays of Elia*
Owen Wister's *The Seven Ages of Washington*
The Spectator Papers
Thayer's *Life of John Hay*
Oliver Goldsmith
Celebrated Friendships of the Eighteenth Century
Holmes' *The Autocrat of the Breakfast Table*
Richard Sheridan
Howells' *Literary Friends*
Howells' *Literary Passions*
Samuel Johnson and the Thrales
A. Edward Newton's Johnsoniana
Johnson's Literary Club
Oliver Goldsmith according to Irving
Robert Louis Stevenson's *Inland Voyage*
The *Atlantic Monthly's* "Contributor's Club"
Essayists of *Scribner's* and the *Century*
James Boswell
Dr. Johnson in Current Literature
The Autobiography of Benjamin Franklin
Washington Irving
Charles and Mary Lamb
Arthur Pound's Essays in the Current *Atlantic Monthly*
Out of Door Life in the *Atlantic Monthly*

Besides furnishing information and pleasure to the class and providing for the instructor a measure or test of the pupils' work, the reports were often advertising devices that led to further reading by others in the class, sometimes at school, more often at home.

The home reading was purely voluntary; no boy was urged to read at home. The books on the table, however, were equipped with library cards, and a librarian was always in the room for one-half hour after school to make it easy for any who cared to take the books home for overnight use. The instructors made no effort other than the general record described to check this reading, and the boys knew that such was the case, so that all reading done outside was an evidence of their interest.

A careful record of all of their reading, regardless of where it was done and why, was kept on 4×6 cards which were filed on the instructor's desk. The author, the title of the essay, and the number of pages read were reported. The result of this record may be seen in the last section of this article.

After the reading was completed, a week was devoted to a critical study of the essay as a form of literature. Three days were devoted successively to a classification of essays by type, to a summarization of the various methods of approach in essay writing, and to a discussion of qualities of style. All of this was done inductively by gathering points from the boys concerning the essays they had read. The results of each day's work were kept in a notebook. The boys showed a great deal of intelligence in classifying the essays and much appreciation of the technique of essay writing. It was interesting to note that the whimsical essay was hardly more popular than the biographical and that instinctively Macaulay was used as a criterion of style.

Two days were devoted to written work. The boys were asked to write a personal reaction to the course or to produce a bit of original creative writing inspired by the course. This writing was done in class. The results of the work appear in the last section of this article.

The instructors in planning this seven weeks' study of the essay made no definite schedule of the number of hours to be devoted to each phase of the teaching. The course grew of itself. Now that it can be viewed as a completed undertaking, it is easy to note the proportion of time given to each phase. Approximately one-half period for two weeks was devoted to oral reading by the instructor, six periods to literary conversations of the two kinds, about two-thirds period for two and one-half weeks to formal reports, five periods to a critical study of the essay, and the rest of the time to reading. The value of a summary of this kind lies, not in any limitations it may set on a future course, but in the suggestion it brings to the authors of this report that success in teaching literature depends partly on a variety of techniques, no one of which is overdone.

An examination of the results of this teaching, in so far as they can be ascertained accurately in terms of the objectives set forth in the introductory paragraphs of this study, seems to be the obvious and appropriate conclusion to this report. The foregoing description of the techniques employed makes evident that during the periods or portions thereof devoted to silent reading the pupils must have read a considerable volume of material. Objective evidence of the nature, the variety, and the quantity of this reading is presented in Table I.

TABLE I

Author	Work	Amount Read	Number of Students Reporting
Addison, Joseph, and Steele, Richard	*The Spectator*	8 to 75 essays	4
Arnold, Matthew	*Essays in Criticism*	2 essays	1
Bacon, Francis	*Essays*	6 to 20 essays	2
Bennett, Arnold	*How to Live on Twenty-four Hours a Day*	complete	1
Bennett, Arnold	*Literary Taste and How to Form It*	complete	1
Boswell, James	*Life of Samuel Johnson*	partial complete	3 2
Brasol, Boris L	*Socialism and Civilization*	40 to 60 pages	3
Briggs, Le Baron R	*College Life*	complete	4
Burke, Edmund	*Conciliation with the American Colonies*	complete	3
Burroughs, John	*My Boyhood*	complete	1
Burton, Richard	*Literary Likings*	Part I	2
Carlyle, Thomas	*Heroes and Hero-Worship*	complete	1
Chesterton, Gilbert K	*Varied Types*	3 essays	2
Cipriani, Lisa	*A Tuscan Childhood*	complete	1
Clark, Thomas Arkle	*The High School Boy and His Problems*	complete	1
Colvin, Sidney	*Memories and Reminiscences*	50 pages	2
Cunliffe, Pyre, and Young	*Writing of Today*	6 articles	4
Depew, Chauncey	*Leaves from My Autobiography* (*Scribner's*)	1 instalment	1
DeQuincey, Thomas	*Confessions of an English Opium Eater*	50 to 60 pages	4
Disque, Brice P	*Prison Progress* (*Atlantic Monthly*)	1 essay	1
Dodge, Louis	*The Sidewalks of New York* (*Scribner's*)	1 essay	1
Doyle, A. Conan	*Through the Magic Door*	complete	2
Edwards, Agnes	*Our Common Road*	complete	1
Franklin, Benjamin	*Autobiography*	complete	4
Grayson, David	*Adventures in Friendship*	complete	2
Grayson, David	*The Friendly Road*	complete	1
Hawthorne, Julian	*Hawthorne and His Circle*	complete	1
Hayward, A	*Life and Letters of Mrs. Piozzi*	complete	4
Hazlitt, William	*The Spirit of the Age*	2 essays	2
Holmes, Oliver Wendell	*Autocrat of the Breakfast Table*	complete	4
Howells, William Dean	*Literary Friends*	complete	1
Innes, George, Jr	*Life, Art, and Letters of George Innes*	complete	2
Ireland, Alleyne	*Joseph Pulitzer*	complete	2
Irving, Washington	*Oliver Goldsmith*	complete	5
Johnson, Samuel	*The Rambler*	20 essays	1
Krapp, George P	*Irving and the Sketch Book*	complete	1
Lamb, Charles	*Essays of Elia*	complete	2
Lane, Franklin K	*The American Tradition*	complete	1
Le Gallienne, Richard	*Rudyard Kipling*	complete	1
Lindsay, Ben B	*The Beast*	complete	1
Lowell, James Russell	*Among My Books*	3 essays	1
Macaulay, Richard B	*Milton*	complete	1
Macaulay, Richard B	*Essay on Warren Hastings*	complete	1
Macaulay, Richard B	*Life and Writings of Addison*	complete	2
Newman, John Henry	*University Sketches*	complete	1
Newton, A. Edward	*Amenities of Book-Collecting*	complete	2
Newton, A. Edward	*A Magnificent Farce*	complete	5
Pepys, Samuel	*Diary*	100 pages	6
Pound, Arthur	*The Iron Man* (*Atlantic Monthly*)	4 essays	1
Rees, Byron J	*Modern Prose Selections*	12 pages	1
Roosevelt, Theodore	*Letters to His Children*	complete	5
Ruskin, John	*Sesame and Lilies*	complete	2
Secombe, Thomas	*The Age of Johnson*	1 essay complete	2 3
Sothern, E. H	*The Melancholy Tale of Me*	complete	2
Spear, M. E., and Norris, W. B	*World War Issues and Ideals*	complete	1
Stevenson, Robert Louis	*Memories*	complete	1
Stevenson, Robert Louis	*Reminiscences*	30 pages	1
Stevenson, Robert Louis	*Letters*	complete	1
Stevenson, Robert Louis	*Across the Plains*	complete	1
Stevenson, Robert Louis	*Valaima Letters*	complete	1
Stevenson, Robert Louis	*An Inland Voyage*	complete	2
Stevenson, Robert Louis	*Travels with a Donkey*	complete	1
Swift, Jonathan	*Tale of a Tub*	complete	1
Tannenbaum, Frank	*Prison Facts* (*Atlantic Monthly*)	4 essays	1
Tennyson, Hallam	*Memoirs of Alfred Tennyson*	complete	2
Tagore, Rabindranath	*My Reminiscences*	29-35 pages	2
Thayer, W. R	*Life of John Hay*	complete	1
Tinker, Chauncey	*Boswell in Love* (*Atlantic Monthly*)	complete	1

TABLE I—*Continued*

Author	Work	Amount Read	Number of Students Reporting
Tinker, Chauncey	*Boswell Takes a Wife* (*Atlantic Monthly*)	complete	1
Winter, William	*Modern America*	1 essay	1
Winter, William	*Old Friends*	2 essays	1
Anonymous	*Mirrors of Downing Street*	complete	4
Anonymous	*Mirrors of Washington*	complete	4
Atlantic Monthly	Miscellaneous	8 essays	2
Century Magazine	Miscellaneous	9 articles	1
Scribner's Magazine	Miscellaneous	11 essays	1
Harper's Magazine	All essays for one month	complete	1

From time to time the instructor passed among the pupils during periods of silent reading for the purpose of observing individual choice and progress. On March 1 a census of the classroom reading actually under way on such an occasion revealed the following list of active reading:

The Spectator (bound volume)
Stevenson, *Across the Plains*
Tannenbaum, "Facing the Prison Problem" (*Atlantic Monthly*)
Stevenson, *An Inland Voyage*
Stevenson, *Memories and Portraits*
Roosevelt, *Letters to His Children*
Burroughs, *Selected Essays*
Le Gallienne, *Rudyard Kipling*
Newton, *A Magnificent Farce*
Newton, *Amenities of Book-Collecting*
Briggs, *College Life*
Macaulay, *Collected Essays*
Brooke, *Letters from America*
Stevenson, *Letters*
Anonymous, *Mirrors of Downing Street*
Anonymous, *Mirrors of Washington*
Atlantic Monthly
Scribner's Magazine
Century Magazine
Harper's Magazine

The book lists quoted show that the reading done during the class periods was of worthy literary character if not always of classic age that it was sufficiently varied in range and of quantity adequate to care for individual differences and to impart a freedom to the activity, and that a very satisfactory amount of reading was actually accomplished.

Evidence of appreciation of individual selections interpreted or advertised by partial readings by the instructors or class members is present in three sorts. In conversation and in brief frank statements of reaction, a number of boys recorded the awakening of new literary and life-interests through the contacts established by the course. One read *Don Quixote* because of William Dean Howells' enthusiastic comment on the book, recorded in his *My Literary Passions*. Another made a study of all of the authors mentioned by William Winter in *Old Friends* without assignment or even suggestion by the teacher. Two have likewise recorded a new interest in places and travel and two in political situations through the reading of this course. One followed diligently and with great interest a series of articles on prison conduct in the *Atlantic Monthly*. Still another boy, previously somewhat interested in art, was attracted by A. Edward Newton's *A Sane View of William Blake* to pursue further his study of Blake's literary and artistic work and is making one of Blake's figures the basis of a drawing for the athletic section of the school annual.

A great many quotations could be made from appreciative comments given voluntarily by the boys at the conclusion of the unit. The objective value of this sort of evidence is always in question on grounds of a naturally greater desire on the part of the pupils to please the instructor or "get a good grade" than to tell the exact truth about their reactions. However, it is believed that the validity of this question is reduced to a minimum in this case, as there are no grades in jeopardy under the system in use in the University High School, and the boys have been equally frank and honest in rejecting authors or books which did not please them. A few such comments are therefore quoted for what they may be worth.

> The essays of Stevenson appealed to me more than the others I read. Perhaps this was because the breath of spring was in the air and blew in the open windows stirring the pages as I read. The book seemed to breathe forth a like atmosphere and thrilled me with a restless longing to travel. I read on, letting my imagination wander with Stevenson through quiet fields and quaint towns. There were no blood-curdling incidents here, only the thrill that comes with expectancy, the mystery of what lies beyond the bend. Stevenson's style is much like a river, flowing smoothly, yet fairly bristling with life. In this easy style he sends me the call to adventure and a desire to seek for the ends of the earth.—F. D.

> I think the main thing the essay project did for me was to point out a few very interesting essays which I will read. These were pointed out mainly through the talks. For instance, J. F.'s talk on *The Autocrat of the Breakfast Table* and his comments made me sure that I should like parts of it. On the

other hand, some made me equally sure that I should not care for the books they reported on. To illustrate, I tried to read *Sesame and Lilies* after J.'s report and, as I expected, found it exceedingly dry. With one exception, the essays I read were as I had previously guessed them to be. The one exception was the *Sir Roger de Coverly Papers*. Expecting these to be very dry, I found that after I got well into the book I was greatly interested in the extraordinary manners and customs of Sir Roger, and I found myself wishing that I might find more of these essays. However, the other essays of this series did not interest me greatly. I think this was because there was no Sir Roger, no Will Honeycomb, and no Will Wimble in the others I read. This course has not decreased my interest in fiction, but has developed my taste for essays, and I am glad this was done, as before I would not have thought of reading essays for pleasure.—W. D.

The first book of essays I picked up happened by chance to be Carlyle's *Heroes and Hero-Worship*. I imagine there was something in the title of the book that attracted me; I was expecting to be thrilled by some heroic tale. After the first page of reading my expectations were shattered, and I found myself plowing through a mass of conglomerate material dealing with Cromwell, the French Revolution, and what not. As I wanted to see what the essay was all about, I finished the part concerning kings after three days of bewilderment.

However, there was a pleasant compensation in the reading, for I noticed that each day the reading became easier and by the end of the three days I found myself reading more easily, slowly, to be sure, but at a better rate than plowing. I not only became able to read, but I even enjoyed the material a little on the third day. In the case of all the books of essays I read after the first, I noticed this increased ability to read, understand, and enjoy books which were much deeper than most of the literature I had previously read. I consider this augmented capacity that has developed from this study as the great benefit which I have derived from the essay project. A study in which one advances his ability and taste is assuredly worth while, and I feel that there is no doubt that with me the change is not merely temporary, for after reading several essays, I came back to another part of the almost dreaded *Heroes and Hero-Worship* and sincerely enjoyed it.—J. F.

A third evidence of appreciation of the essay and biography unit is to be found in the pieces of creative work stimulated by the reading As stated above, at the conclusion of the unit, the boys in one class were required to write a paper of four to six pages. Choice was given the pupils between the mere summary of the unit's reading, an appreciative or reaction paper, or an original paper of the same character as some selection read. Out of a class of twenty-four, six boys wrote summaries under the title "Essays and Biographies I Have Read." Four tried to define the value of the unit to themselves under the subject of "What the Essay Unit Has Given Me." Fourteen boys attempted original creative work suggested by some reading from the unit. The subjects and frequency of choice were: "A Point of View in School Athletics" 2, "Hypothetical Meditations of an Actor" 1, "Another Magnificent Farce" 1, "An American Inland Voyage" 1, "A Mountain Pilgrimage" 1, "Mirrors of Belfield Hall" 3, "Camping Caricatures" 1, "Male Flappers" 3, and "School" 1.

Evidence of the nature of literary tastes established and of the permanence of reading interests aroused by the unit is scarcely to be hoped for in any quantity in the period of eight weeks following the completion on March 3 of the unit dealing with essay and biography. The spring and early summer, moreover, are not favorable to much voluntary reading on the part of boys. Baseball, tennis, and radio are formidable and, perhaps, worthy rivals of Charles Lamb and Arnold Bennett in engaging and holding boy interest. An examination of the general reading cards, on which all voluntary readings are recorded, besides revealing reading done to a considerable degree in the literature of the three diversions just named, has, nevertheless, shown the following significant facts.

The boy mentioned as being interested in the prison articles in the *Atlantic Monthly*, continued as a regular reader of the magazine, with which he made initial contact through this unit of the course. Another records reading recently Clark's *The High School Boy and His Problem*. The boy whose enthusiastic appreciation of Stevenson is quoted has read since April 3 Lytton Stracchey's *Queen Victoria* and five essays from current magazines. The boy whose discussion of Carlyle is quoted recorded on April 8 Emerson's *Self-Reliance*. One has read since the close of the unit two essays by Charles Lamb; one, eleven of Lamb's essays; another, Roosevelt's *Letters to His Children*, which was advertised during the study; one records reading a life of Roosevelt; and still another, Boswell's *Life of Johnson*. There is very good reason to believe that these were all carried over in interest from the unit of work. One more case is unmistakable. A boy who had read nothing but fiction previous to the essay study recorded reading since March 15 fourteen essays from magazines, two critical studies of authors, and two complete biographies.

By the cumulative force of all of the evidences presented, the authors of this report feel justified in the conclusion that the techniques described have served to realize to a satisfactory degree for the unit involved the objectives outlined for the course.

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CURRICULUM PRACTICES IN THE JUNIOR HIGH SCHOOL AND GRADES 5 AND 6

By
JAMES M. GLASS

THE UNIVERSITY OF CHICAGO
CHICAGO, ILLINOIS

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Pennsylvania State Department of Public Instruction

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PREFACE

During the first half of the year 1923 the author undertook, at the invitation of a committee of the Commonwealth Fund, an investigation of the practices of a number of school systems in the administration of their elementary courses of study. This investigation was one of a series dealing with the various units of the American educational system. It concerned itself with Grades 5 to 9 and attempted to secure detailed information regarding the courses of study. The results of the investigation, which was carried on in fourteen cities, are presented in the following pages.

A study of the curriculum practices in fourteen municipal school systems necessarily involves the co-operation of many persons. It is difficult, therefore, to acknowledge properly the co-operation of all who participated in the investigation.

The writer wishes to acknowledge first the unfailing courtesy and co-operation of the superintendents, their associates, and the principals who assisted in directing the work of investigation in their own centers. Their interest stimulated teachers to undertake voluntarily and earnestly the arduous task of making detailed reports. Deep gratitude is extended to the several hundred teachers who reported their classroom practices. It may be some compensation for these teachers to know that their contributions have made it possible to prepare this report wholly from the point of view of the actual curriculum practices of the classroom and thus to avoid the more or less visionary pronouncements of printed courses of study and other documentary statements about curriculum practices.

Helen S. Watson, assistant superintendent of the Los Angeles schools, conducted the investigation in Los Angeles and secured the co-operation of the school system of Berkeley. Acknowledgment is made to Miss Watson and H. B. Wilson, superintendent of the Berkeley schools, for their very helpful assistance in thus extending the investigation to include representative school systems of the Pacific Coast.

The investigation covered thirteen subject fields. It was necessary to organize a series of special questionnaires and subject outlines for each of these fields. The preparation of the questionnaires was an important and vital step in the investigation. The analysis of the subject fields into divisions and units of teaching involved wide knowledge of existing curriculum practices. For assistance in this part of the investigation the writer gratefully acknowledges the co-operation of the following individuals: art questionnaire, C. Valentine Kirby, director of art education, Pennsylvania State Department of Public Instruction; commercial education questionnaire, Frederick G. Nichols, assistant professor of education, Harvard University; grammar outline and questionnaires in English composition and literature, A. Laura McGregor, assistant principal of the Washington Junior High School, Rochester, New York; penmanship questionnaire, H. C. Walker, supervisor of penmanship, St. Louis, Missouri; geography outline, Erna Grassmuck, director of geography, Pennsylvania State Department of Public Instruction; health outline and questionnaire, Charles H. Keene, director of health education, Pennsylvania State Department of Public Instruction; general home economics outline, Helen Dodge Taylor, director of home economics, Pennsylvania State Department of Public Instruction; industrial arts outline, F. Theodore Struck, assistant director of industrial education, Pennsylvania State Department of Public Instruction; Latin questionnaire, Mason D. Gray, special investigator of the American Classical League; mathematics outline, J. Albert Foberg, director of mathematics, Pennsylvania State Department of Public Instruction; modern language outline, G. C. L. Riemer, principal of the State Normal School at Bloomsburg, Pennsylvania; music questionnaire, Will Earhart, director of music, Pittsburgh, Pennsylvania; science outline, Harry A. Carpenter, head of the science department, West High School, Rochester, New York; history outline, Charles E. Finch, director of the junior high school grades, Rochester, New York; community civics, vocational civics, and economic civics outlines, Charles E. Finch, Rochester, New York, and J. Lynn Barnard, director of social studies, Pennsylvania State Department of Public Instruction.

To Charles H. Judd, W. W. Charters, and A. B. Meredith, of the committee in immediate charge of the investigation, and to Max Farrand, L. P. Ayres, E. P. Cubberley, E. L. Thorndike, and S. P. Capen, members of the Educational Research Committee of the Commonwealth Fund, the writer extends his special acknowledgment for making the investigation possible and for counsel received during both the period of organization and the period of the field survey.

J. M. G.

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CHAPTER I

INTRODUCTION

There is nothing more characteristic of American schools than the fact that they are organized and conducted as independent local units. Especially is it true that each school system arranges the details of its courses of study without coercion from any outside authority. State departments of public instruction often advise, through general outlines, regarding the ground to be covered in the subjects of instruction, but even when these general outlines are accepted as guides, individual school systems and often individual teachers are free to determine the emphasis which is to be given to particular sections of a subject.

The result of local autonomy is that a great many experiments are being tried in American schools. Some of these experiments are undertaken with full consciousness, on the part of those who inaugurate them, of the need of reform. Others are being tried by teachers and school superintendents who are looking for better methods of instructing pupils and are confused because there are no universally accepted practices in the schools around them.

The wide divergences in the practices of American schools can be made a most helpful basis for educational progress if some method can be devised of finding in the midst of these divergences those practices which are most successful. In other words, if the schools of this country can take advantage of this free experimentation by adding to their present local independence some means of comparison of results which shall serve as a rational guide to local initiative, American democratic school organization will be perfected without resorting to the kind of authoritative unification of educational systems which has been common in Europe.

In Europe, education has been guided by the central governmental authorities. Strict dictation of the content of the curriculum and of the time allotted to each division of the curriculum has been the rule. The result is that educational practices have been much less subject to change in the older civilizations than in this country. What has been done in European schools has, as a consequence, often been better done as compared with the work done in schools on this side of the Atlantic, but the conservatism inherent in the organization of the European schools has prevented the kind of development which has been characteristic of our progressive, though less well systematized, democratic schools.

In addition to the general argument which can be presented in favor of a continuation of the American plan and the development of a means of comparing results which shall guide future local experimentation, there are special reasons why at this stage in the evolution of American schools it is peculiarly appropriate that a movement should be started for a careful study of such experience as has been accumulated. This country has in recent years passed through a period of very great expansion of its educational system, and there are evidences clearly visible to anyone who studies the schools of today that an era of fundamental reorganization is at hand.

Among these evidences of imminent reorganization are the following: First, there is an insistent demand that more information be introduced into the school which shall prepare pupils for intelligent citizenship. This new body of material cannot be put into the curriculum without some kind of a radical readjustment because the time of the school seems to be fully occupied with the traditional subjects.

Second, the school has been made responsible by modern society for many forms of training which formerly were provided in the home or in industry. The appearance of household arts and shopwork in the elementary-school curriculum has made it very urgent that these practical subjects and such traditional subjects as reading and arithmetic be adjusted to one another with the fullest regard to the efficiency of the pupils in later life and to the harmonious correlation of the subjects taught in the school.

Third, a clear recognition of the different kinds of educational needs of pupils of different ages and of varying degrees of native intelligence has made teachers aware of the advantages of putting in the same classes, for purposes of teaching and recreation, those pupils who are of the same degree of maturity and of the same intellectual bent.

Other evidences could be cited, but perhaps those which have been enumerated will be accepted as supporting adequately the general argument. Social progress and educational experience have brought the communities of the United States to the point where their schools can no longer accept with complacency a program of studies or a form of organization laid down a generation ago. The same spirit of progress which has changed the character of American industry must be recognized as operative in the educational system. This being the case, it is highly desirable that guidance for the future development of the schools shall be found in the scientific study and comparison of all of the experiments which are now being tried in local school systems.

CHAPTER II

THE NEED OF SCIENTIFIC RECONSTRUCTION OF THE CURRICULUM

The report which is presented in the following pages is a first step in the direction of such a study as is suggested in the Introduction. The writer investigated in 1923, through personal visits, a number of school systems in different parts of the country. He was commissioned to seek information in each of these school systems with regard to the amount of time devoted to the major subdivisions of the curriculum administered to the pupils in the fifth, sixth, seventh, eighth, and ninth school years or in as many of these years as could be studied with the co-operation of the local teachers and school supervisors in the week which was allotted to each city.

It was possible under this general plan of study to cover fourteen centers. They were chosen in different parts of the country with a view to including especially those which had undertaken some special reconstruction of the upper grades of the elementary school. The full list of the centers studied is as follows: Atlanta, Georgia; Berkeley, California; Birmingham, Alabama; Cleveland, Ohio; Decatur, Illinois; Denver, Colorado; Detroit, Michigan; Kansas City, Missouri; Los Angeles, California; Okmulgee, Oklahoma; Pittsburgh, Pennsylvania; Rochester, New York; St. Louis, Missouri; and Somerville, Massachusetts.

The plan of procedure was as follows. A letter was sent to the superintendent of schools in each center selected for study, and co-operation was invited. In every case cordial co-operation was promptly given. This meant that the writer of this report was put into direct contact with the principals and teachers of two typical schools in each school system and was allowed to hold conferences with them and to receive through them a detailed account of the practices in their schools.

The next step in the plan of study was to analyze the subjects of instruction into their main divisions. Thus mathematics was divided into three major subject divisions, namely, arithmetic, intuitive geometry, and algebra. Each subject division was further subdivided into major units of teaching. For example, arithmetic was subdivided into five units of teaching—fundamental operations, tables of weights and measures, percentage, mensuration, and social arithmetic. Each major unit of teaching was further analyzed into a number of divisions of units of teaching. For example, fundamental operations was divided as follows: fundamental operations as applied to integers, as applied to common fractions, and as applied to decimal fractions. Other subjects were analyzed in like fashion.

Printed and mimeographed sheets were prepared on which entries could be made relative to the subjects of instruction and their subdivisions. These sheets were put into the hands of the teachers. Conferences were held with them in order to make sure that they understood the blanks. They were then asked to indicate in each case the amount of time which they devote during the year to classroom work.

The results secured have been tabulated and will be presented later in this monograph. The tables aim to show the practices of each of the school systems studied and to provide an easy means of comparison of these practices.

TABLE I

HIGHEST, LOWEST, AND AVERAGE NUMBER OF MINUTES ALLOTTED EACH WEEK TO ENGLISH IN THE FOURTEEN SCHOOL SYSTEMS

Grade	Highest Number of Minutes	Lowest Number of Minutes	Average Number of Minutes
5............	500	225	415.6
6............	500	225	404.0
7............	400	180	303.6
8............	435	200	269.5
9............	420	200	265.7

No effort was made to test the results achieved by the pupils in the different school systems. As previously stated, this study is merely a first step in a general examination of American practices. It arrives at one perfectly clear conclusion, namely, that the periods of time devoted in various school systems to a given subject of instruction and to the subdivisions of that subject are impressively different. One cannot examine the findings without being led at once to the question, How can school systems differ so radically if all are producing results that are satisfactory?

By way of illustration of the kind of results secured let us examine a summary dealing with English, a subject universally included in the curriculum of the elementary schools. When the practices of schools differ as widely as indicated by the figures in Table I, very little argument is required to establish certain conclusions. First, experimentation in the administration of the curriculum has evidently followed widely divergent lines in different school systems. Second, it is urgently to be desired that those who are spending the longer periods justify their practices and answer the question whether they have proper regard for the demands of economy; those who are using the shorter periods should answer the question whether they are giving adequate training.

Since Table I deals with the absolute number of minutes a week devoted to English, it is open to the criticism that the relative emphasis on English in the various school systems is not shown because there is no uniformity with regard to the number of days in the school year and the number of hours in the school day. Another series of figures has accordingly been prepared showing the relative amount of time given to English. The percentage of the school week devoted to English has been computed and is recorded in Table II. The figures in this table do not modify the conclusions reached in connection with Table I.

TABLE II

HIGHEST, LOWEST, AND AVERAGE PERCENTAGE OF THE SCHOOL WEEK DEVOTED TO ENGLISH IN THE FOURTEEN SCHOOL SYSTEMS

Grade	Highest Percentage	Lowest Percentage	Average Percentage
5	31.7	16.7	26.0
6	31.7	15.8	25.3
7	29.1	12.1	19.0
8	32.2	12.1	16.3
9	31.1	12.1	16.5

If we turn to the divisions of another major branch of study universally accepted in the core curriculums of all fourteen school systems, we find practices as divergent as those shown in Tables I and II. A summary is given in Table III of the time devoted to the subject divisions of general mathematics, namely, arithmetic, intuitive geometry, and algebra. This table shows that as the analysis of the curriculum is extended into the details of the subject divisions an even greater degree of divergence prevails than was revealed in Tables I and II. It is evident that, in addition to the divergent practices in time allotments to arithmetic in Grades 5, 6, 7, and 8, there is some experimentation with the articulation of arithmetic with algebra and intuitive geometry. The experimentation is of two types. First, in some cases there is an introduction of geometry and algebra into Grades 7 and 8; second, in other centers which have adopted general mathematics numerous variations are being tried in the amount of time allotted to the subject.

An extension of the analysis to the units of teaching in arithmetic reveals similar variations in practice. In this case the time allotments are considered for each semester in each of the five grades. The figures in Table IV show in minutes a semester the extent of variation between the time allotments in the fourteen school systems. Table V shows the number of centers which give instruction in the various topics in the different semesters.

TABLE III

HIGHEST, LOWEST, AND AVERAGE NUMBER OF MINUTES ALLOTTED EACH WEEK TO THE DIVISIONS OF REQUIRED GENERAL MATHEMATICS IN THE FOURTEEN SCHOOL SYSTEMS

Grade	Arithmetic			Algebra			Intuitive Geometry		
	Highest	Lowest	Average	Highest	Lowest	Average	Highest	Lowest	Average
5	300	125	204	......	......	......	......	......	......
6	275	120	200	......	......	......	......	......	......
7	275	100	192	82	23	53*	150	9	90†
8	275	75	165‡	150	69	104†	105	8	75§
9	225	100	175‖	300	100	216‡	125	60	85‖

* Only two centers reported algebra in the seventh year; the average is taken for these two school systems.

† Six centers.

‡ Ten centers.

§ Five centers.

‖ Three centers.

TABLE IV

DIFFERENCE BETWEEN THE HIGHEST AND THE LOWEST NUMBER OF MINUTES ALLOTTED EACH SEMESTER TO THE UNITS OF TEACHING IN ARITHMETIC

Grade	Fundamental Operations	Tables of Weights and Measures	Percentage	Mensuration	Social Arithmetic
5-1	3,950	1,595	200	20	925
5-2	3,475	1,350	1,157	283	750
6-1	3,800	2,900	1,600	875	200
6-2	1,275	2,900	2,300	525	550
7-1	2,290	2,090	1,400	1,020	1,450
7-2	1,600	415	2,350	1,920	2,200
8-1	280	775	2,550	2,150	2,025
8-2	640	1,850	2,650	680	1,975
9-1	120	....	870	....	....
9-2	....	....	....	....	....

A review of the complete tables in the following chapters will show similar divergence of practice in all of the constants of the curriculum.

Wide variations in time distribution characterize the whole curriculum. There is revealed in all of these facts a general disturbance in curriculum administration which must be recognized as indicative of a generally accepted purpose to reconstruct the curriculum.

Turning from the subjects which are required in all of the school systems to those which are optional in any or all of the systems, we find that variations in practice are so general that there can hardly be said to be any common practice. In a consideration of the elective subjects we are dealing almost wholly with the last three grades covered in this investigation, that is, the seventh, eighth, and ninth years, or the junior high school period. Certain major subjects have been so generally accepted as required subjects that they are rarely offered as electives in the seventh, eighth, and ninth years; these are English, mathematics, geography, history (social studies), and health education. However, there are in the curriculum today several other subjects which are demanding recognition in the core curriculum. The extent to which these subjects are administered as constants or electives may be seen from Tables VI and VII. These tables summarize conditions in the administration of the fine arts—art (drawing) and music; the practical arts—industrial arts and home economics; and science. Natural science and the fine and practical arts are being steadily incorporated into the core curriculum, thereby increasing the number of required subjects from the generally accepted four—health, English, mathematics, and social

TABLE V

NUMBER OF CENTERS WHICH INCLUDE EACH UNIT OF TEACHING IN ARITHMETIC IN THE WORK OF THE VARIOUS SEMESTERS

Grade	Fundamental Operations	Tables of Weights and Measures	Percentage	Mensuration	Social Arithmetic
5-1	14	9	2	2	3
5-2	14	10	3	2	4
6-1	14	11	8	3	3
6-2	10	11	13	7	5
7-1	12	5	11	5	7
7-2	12	8	11	10	12
8-1 *	4	4	4	3	8
8-2 *	5	6	6	3	8
9-1	2	1	2	1	1
9-2	....	....	1	....	1

* Three of the co-operating school systems are organized on the 7-4 plan and do not have the usual eighth year. There are, therefore, only eleven centers reporting for this year.

studies—to six, including these four and the two mentioned, namely, natural science and the arts courses.

TABLE VI

NUMBER OF CENTERS WHICH INCLUDE SCIENCE AND THE FINE AND PRACTICAL ARTS IN THE CORE CURRICULUM

Grade	Science	Art	Music	Industrial Arts	Home Economics
7............	6	12	13	12	11
8*...........	7	10	11	10	9
9............	3	4	9	5	3

* Three of the co-operating school systems are organized on the 7-4 plan and do not have the usual eighth year. There are, therefore, only eleven centers reporting for this year.

TABLE VII

NUMBER OF CENTERS WHICH INCLUDE SCIENCE AND THE FINE AND PRACTICAL ARTS AS ELECTIVES IN THE PROGRAM OF STUDIES

Grade	Science	Art	Music	Industrial Arts	Home Economics
7........	2	3	13	7	5
8*.......	1	5	10	9	8
9........	8	11	11	13	13

* Three of the co-operating school systems are organized on the 7-4 plan and do not have the usual eighth year. There are, therefore, only eleven centers reporting for this year.

The slow surrender of the traditional subjects, which have long been accepted because of their supposed disciplinary values, to the newer subjects which stress social and practical values is a matter of general knowledge. The conditions of curriculum administration, however, which have resulted from widespread experimentation in the readjustment of disciplinary-cultural and social-practical values are not so generally understood. It is these conditions of extensive and general divergence of present practices which it is the purpose of this chapter to disclose.

The chaotic condition revealed by the tables presented and by those which will be given in later sections of the report would be utterly discouraging if it were not for the prospect that there will inevitably follow efforts to bring about curriculum reconstruction in general by methods which have already been adopted in several of the fourteen school systems, namely, purposeful and persistent scientific research.

It will perhaps be appropriate to sketch the present development of the scientific movement in education as related to the facts presented in the foregoing pages.

The recent scientific movement in education began with the development of standards of measurement. Practicable methods of measuring general intelligence and the results of teaching are in universal use. The outcome is a degree of discriminating and purposeful administration previously impossible. In a large majority of the fourteen centers the administrative direction of the curriculum is in the hands of a member of the superintendent's staff, variously designated as the director of measurement and research, director of educational statistics, associate superintendent in charge of educational research, director of the bureau of measurement, etc.

The scientific determination of the results of teaching is leading in all of these centers to a scientific evaluation of the materials of instruction. A scientific analysis of the materials of teaching must in turn lead to an analysis of the objectives of instruction. If objectives are to be scientifically established, they must be based on a scientific study of the needs of pupils as revealed in modern society and of the skills, abilities, and attitudes conditioning useful citizenship.

The present status of the scientific movement in education may be gauged by the following facts revealed in the investigation: (1) All of the fourteen centers are employing measurements in the scientific determination of the results of teaching and of the ability to learn. (2) There is general organization of committees to reorganize the materials of instruction. Most frequently the purpose of these committees is revision, not reconstruction. (3) There are a few centers in which definite efforts are directed toward a re-evaluation of objectives. (4) In a limited number of the centers a scientific study of the actual needs of the pupils is being undertaken. In each case this step has been taken subsequent to the other stages of the movement.

CHAPTER III

THE CURRICULUM OF THE JUNIOR HIGH SCHOOL

A separate chapter may properly be devoted to those changes in the curriculum which are characteristic of the junior high school, because the organization of this new type of school has been the cause and occasion of most of the significant modifications which have appeared in the courses of study of the seventh, eighth, and ninth years. The writer was asked to contribute a statement of his findings with regard to the junior high school to the 1924 yearbook of the Department of Superintendence of the National Education Association. He prepared a report[1] for that publication which is here repeated in condensed form.

The curriculum of the junior high school includes certain constants and certain electives. Table VIII shows the average number of minutes a week devoted to the constants in Grades 7, 8, and 9 in the fourteen centers investigated. Table IX shows the average proportional allotment of the school week to the constants. It should be noted that the figures in Tables VIII and IX are based on the positive cases only. For example, in Table IX the figure 11.5 which is given for industrial arts in the ninth grade is derived from the reports of five centers which include this subject among the constants. In order that the reader may properly interpret Tables VIII and IX, Table X is added, showing for each subject and grade the number of positive cases.

TABLE VIII

AVERAGE NUMBER OF MINUTES A WEEK ALLOTTED TO EACH CONSTANT BY THE FOURTEEN SCHOOL SYSTEMS

Grade	Art	English	Geography	Health	Home Economics	Industrial Arts	Mathematics	Music	Science	Social Studies
7	82.9	303.6	155.6	150.3	180.0	175.8	238.1	70.0	132.0	245.0
8	85.0	269.5	120.3	152.6	131.3	169.0	241.4	67.6	178.3	239.5
9	120.0	265.7	......	151.2	283.3	183.0	298.3	73.4	195.0	172.1

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[1] "Present Curriculum Practices in the Junior High School," *The Elementary School Curriculum*, pp. 227–42. Second Yearbook of the Department of Superintendence. Washington: Department of Superintendence of the National Education Association, 1924.

Table X shows that practice is by no means standardized. It is obvious that certain practices, as, for example, the inclusion of English in every grade, are general. On the other hand, the inclusion of home economics and industrial arts in the ninth year must be described as a tendency rather than as an established practice. Wherever variations appear, it may be said that the schools are experimenting with the curriculum. Experimentation should undoubtedly be encouraged as the best method of arriving at permanent and wholesome solutions of the problems of curriculum organization.

TABLE IX

AVERAGE PROPORTIONAL ALLOTMENT OF THE SCHOOL WEEK TO THE CONSTANTS OF THE CURRICULUM IN THE FOURTEEN SCHOOL SYSTEMS

Grade	Art	English	Geography	Health	Home Economics	Industrial Arts	Mathematics	Music	Science	Social Studies
7.........	5.3	19.0	9.8	9.3	11.0	10.4	14.8	4.3	7.9	15.2
8.........	5.3	16.3	7.4	9.1	8.0	9.9	14.3	4.0	10.6	14.3
9.........	7.6	16.5	......	9.4	14.7	11.5	18.3	4.4	11.7	10.6

TABLE X

NUMBER OF CENTERS WHICH INCLUDE EACH CONSTANT IN THE CURRICULUM OF EACH YEAR

Grade	Art	English	Geography	Health	Home Economics	Industrial Arts	Mathematics	Music	Science	Social Studies
7.........	12	14	10*	14	11	12	14	13	6	14
8†........	10	11	3*	11	9	10	11	11	7	11
9.........	4	14	0	12	3	5	9‡	9	3	7

* Geography is part of a composite course in the social studies in the seventh and eighth grades of two of the school systems.

† Three of the co-operating school systems are organized on the 7-4 plan and do not have the usual eighth year. There are, therefore, only eleven centers reporting for this year.

‡ Five centers offer an option of two or more courses in mathematics in the ninth year; some course in mathematics, however, is a part of the core curriculum of the ninth year in all of the school systems.

The appearance of practical subjects in so many of the new curriculums is notable evidence that there is a strong tendency to shift practice from the traditional emphasis on exclusively cultural and disciplinary training to emphasis on training which has practical social value.

Table X can easily be misinterpreted. When one finds that there are only three centers which require home economics in the ninth grade, one can think of the matter in either positive or negative terms. One can say that there is a deficiency in this case in eleven centers, or one can say that the curriculum has been enriched in three centers. The latter is the true method of describing the situation if we think of earlier practice as the basis of comparison. So also in art, industrial arts, and music, and to some degree in science. Wherever these subjects appear, they represent a change from earlier practice in a positive direction.

Table XI contrasts the minimum offerings with the maximum in the different centers. It is evident from this table that the American curriculum is not in a settled condition. While this table presents the facts for the junior high school grades, it may be remarked that this is not the only section of the school where variations appear. The facts reported elsewhere in this monograph show that there are similar variations in the fifth and sixth grades, and it is safe to infer that above the ninth grade and below the fifth grade equally striking variations would be found if investigations were made.

TABLE XI

VARIATIONS IN PRACTICE

GRADE	ART	ENGLISH	GEOGRAPHY	HEALTH	HOME ECONOMICS	INDUSTRIAL ARTS	MATHEMATICS	MUSIC	SCIENCE	SOCIAL STUDIES
	Difference between the Highest and the Lowest Time Allotments in Minutes a Week									
7	160	220	194	240	240	240	150	55	110	125
8	160	235	124	248	148	215	120	45	140	125
9	140	220	......	260	430	105	250	59	120	245
	Difference between the Highest and the Lowest Percentage Distributions									
7	12.4	17.0	14.7	13.4	12.7	12.7	10.9	3.4	6.6	10.0
8	12.7	20.1	9.8	13.4	11.5	11.4	4.6	3.4	9.8	10.1
9	11.5	19.0	......	17.6	20.8	8.9	17.5	3.9	8.3	13.9

Table XII is a hypothetical table introduced to show tendencies. It is made up on the assumption that the weekly program is composed of thirty periods of sixty minutes each and that these periods are distributed in accordance with the percentages reported in Table IX. If the electives and the extra-curricular activities were included, the figures would be modified, but the general tendencies would appear as in this table.

The general situation which is revealed by all of the facts reported is one of vigorous experimentation. Universally accepted objectives are apparently not available. There is a shift of emphasis from the purely disciplinary subjects toward the practical subjects.

Experimentation and consequent variation in practice are promising if they lead ultimately to the adoption of scientific methods of formulating the curriculum. Everywhere we find that junior high school teachers are at work in committees, as are elementary-school teachers and high-school teachers, trying to reformulate the curriculum. Experts are also being invited to co-operate with members of school faculties. The efforts of all of these workers will be effective only when scientific principles are discovered which can guide in curriculum-making. The principles needed can be arrived at only through an analysis of practical social needs. If we can find out what people need in order to be successful in life, we can use this knowledge in formulating courses which shall supply the required training.

After objectives have been defined as a result of a study of practical needs, the next step consists in collecting and arranging the materials of instruction which will realize these objectives.

TABLE XII

AVERAGE NUMBER OF PERIODS A WEEK ALLOTTED TO CONSTANTS

Grade	Art	English	Geography	Health	Home Economics	Industrial Arts	Mathematics	Music	Science	Social Studies
7.........	1.5	5.3	2.8	2.6	3.1	2.9	4.1	1.2	2.2	4.3
8.........	1.6	4.9	2.2	2.8	2.4	3.0	4.4	1.2	3.2	4.3
9.........	2.2	4.7	......	2.7	4.2	3.3	5.2	1.3	3.4	3.0

The materials used in the schools at present are in many cases derived from the social, industrial, and economic conditions of fifty years ago. They must be revised in the light of modern needs. To this end we find many school systems bringing in experts in the same way that business organizations and communities are importing experts to survey their activities and modernize their methods. The time seems ripe for a united effort on the part of all of the agencies which are working in different parts of the country on curriculum reconstruction. A general national canvass of curriculum problems in a co-operative way is the next step which should be advocated.

There are certain indications which appear vaguely in the tables which have been presented and which will become much clearer in later chapters where details are reported regarding the subdivisions of the subjects and the emphasis which is given them in the curriculum. These indications are that the new curriculum will aim, in the first place, to give pupils a variety of experiences and, in the second place, to give them continuity of training. The principles of variety and continuity have been clearly pointed out by such writers as Briggs.[1]

The first decade and a half of the junior high school movement has been devoted largely to the introduction of courses which shall give breadth and variety to the pupil's experience. The term which has frequently been employed to describe the aim of the junior high school program is the term "exploration." Exploratory courses, which are introduced into the curriculum for the purpose of finding out what a pupil's interests and aptitudes are, have been widely cultivated. As a result, courses on vocations, general courses in science covering great ranges of materials, and general courses in commercial subjects, languages, and social subjects have been developed.

Conspicuous among the new courses is the general mathematics course which includes arithmetic, algebra, and geometry. This kind of a course is broad in its contents and has the virtue of uniting the elements of a course such as was formerly given in the seventh grade with elements of high-school courses. The development of such a composite course usually passes through two stages: in the first stage the parts are loosely united; in the second stage the elements are unified and fused into a well-organized systematic course.

For the development and administration of such courses there is need of specially trained teachers. Until teachers can be provided through the co-operation of teacher-training institutions and extension courses and other devices which will tend to improve teachers in service the reconstruction of the curriculum will proceed haltingly.

The development of general courses in fields other than mathematics goes on apace. General science and general courses in the practical arts, in social science, in English, and in health education are becoming common.

Along with the variety which has come through the enrichment of the core curriculum and the development of general courses there must be emphasis on continuity if the junior high school is to administer a unified and well-integrated curriculum.

Table X shows that the principle of continuity does not dominate present practices. Until the principle is more generally adopted than it appears to be in the fourteen centers, which admittedly are representative of the country's best practice, the integration of the junior high school is retarded to a degree which jeopardizes the very existence of the institution. The present lack of continuity in the junior high school core curriculum is evident even on casual observation. Table X shows that art (drawing, applied art, design, etc.) is continued as a constant in the ninth-year curriculum of only four centers, home economics in three centers, industrial arts in five, music in nine, and science in three. Even social studies appears as a constant in the ninth year of only seven centers, exactly one-half of the fourteen centers.

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[1] Thomas H. Briggs, *The Junior High School*, pp. 159–61. Boston: Houghton Mifflin Co., 1920.

English, mathematics, and health are the units of instruction upon which at present is thrown the burden of integrating the core curriculum of the ninth year with the core curriculums of the seventh and eighth years. The abrupt change in required subjects of study for students passing from the eighth year to the ninth year which was characteristic of the school in former years still persists to some degree. The practice runs counter to the demand which the junior high school aims to meet for an educational unit providing a gradual transition from the elementary school to the high school. So long as conditions unfavorable to the fulfilment of the primary functions of the junior high school are permitted to control development, the junior high school cannot achieve its mission.

In the presence of these facts the question arises, Why is there so sharp a break between the eighth and the ninth years? The answer to this question is not far to seek. Tradition and the domination of the high school by college-entrance requirements are the conditions which prevent the ninth year from becoming in full measure a part of the junior high school. There can be no doubt that the present lines of demarcation between the seventh and eighth years and the ninth year must be eliminated to the end that the junior high school may become a self-contained, integrated institution and thus become an effective agency for the promotion of curriculum reconstruction, a fundamental aim in its adoption.

There can be only one college-preparatory unit in the public school system. This has been the senior high school, and this school must continue to be the sole agency responsible for accrediting pupils to the higher institutions. Modifications in its organization, consequent to the 6-3-3 plan, have been accepted by the senior high school itself and should in turn be accepted by the higher institutions. The ability of applicants for college admission to complete a senior high school curriculum of the tenth, eleventh, and twelfth years should be positive proof to college-entrance boards that the pupils have successfully completed the propaedeutic junior high school curriculum. The present situation can be materially simplified for the colleges if they will restrict accrediting relations to the senior high school.

Much of the present confusion and irritation between junior and senior high schools will be removed when the senior high school is not obliged to certify the work of the ninth year. The responsibility for the ninth-year curriculum in 6-3-3 school systems has passed in part and should pass altogether from the senior high school to the junior high school. With the responsibility should also go the opportunity to reconstruct the ninth-year core curriculum in accordance with the reconstruction already initiated in the seventh and eighth years. Insistence by the colleges on sixteen college-entrance units constitutes a condition which threatens the full realization of the principle of continuity in the reconstruction of the junior high school core curriculum.

That a few junior high schools have had the courage of their convictions and have resisted college domination in the reconstruction of the core curriculum of the ninth year is apparent from Table X. The tendency to construct a continuous and articulated core curriculum is unmistakably indicated by even the limited practice of making art, music, home economics, industrial arts, science, and the social studies ninth-year constants. Thus the principle of continuity finds its applications even in spite of opposing conditions. It is the more evident from these cases where the principle has prevailed that conditions which retard the universal application of this principle should not be allowed to exercise their present inhibitory influence.

Finally, the present tendency to modify college-accrediting relations in harmony with the objectives of the new 6-3-3 plan should be promoted and encouraged until the junior high school is able to carry on unhampered the curriculum reorganization already initiated and partly effected in the seventh and eighth years. The junior high school must be free to make of itself a self-contained and integrated unit in the public school system.

Turning from the required subjects to the electives offered in the junior high school curriculum, we find such facts as are reported in Table XIII. A comparison of this table with the earlier tables presented in this chapter will convince the reader that the schools are aiming to accomplish through electives what they cannot fully achieve in the core curriculum. Where it is not possible in the ninth year to continue without interruption the requirements of the eighth year the schools are offering electives which make it possible for at least a part of the pupils to follow the subjects of their choice in the later year.

In some cases the electives serve an additional purpose. Where the core curriculum provides a small amount of work in a given subject a pupil can take more work in the same subject by adding an elective to the required course.

The advantages thus provided through electives are in many cases so important that they ought to be made a part of the required work of the school rather than be left to the choice of the pupils. Thus an examination of any course of study in home economics planned to cover the period of three years in the junior high school will reveal in the ninth year types of class instruction adapted to the greater maturity of ninth-year girls but impracticable in the earlier years because of the comparative immaturity of seventh- and eighth-year girls. Choice of electives should not be permitted, at least in the junior high school, to determine the proportion of girls who will benefit by training in home economics. The need is common to all girls, since 85 per cent of them are destined to become home-makers.

TABLE XIII

NUMBER OF CENTERS WHICH OFFER EACH SUBJECT ELECTIVE IN EACH YEAR

GRADE	ART	COMMERCIAL EDUCATION	ENGLISH	HOME ECONOMICS	INDUSTRIAL ARTS	LATIN	MATHEMATICS	MODERN LANGUAGES		MUSIC	SCIENCE	SOCIAL STUDIES
								French	Spanish			
7	3	6	1	5	7	4	.....	4	5	13	2	.....
8*	5	10	1	8	9	8	.....	8	5	10	1	.....
9	11	13	2	13	13	14	5	12	8	11	8	10

* Three of the co-operating school systems are organized on the 7-4 plan and do not have the usual eighth year. There are, therefore, only eleven centers reporting for this year.

The comparatively more specialized curriculums of the senior high school are likely to preclude required work in home economics. When, therefore, a junior high school is equipped to do effective work in home economics, no influence should be allowed to limit the realization of the important social and practical results which can be achieved through instruction in home economics in a progressively organized series of courses extending through the core curriculum of the three years.

Similarly, in the case of industrial arts, fine arts, science, and social studies, units of instruction adapted to the maturity of ninth-year pupils should be included as the culminating contributions to the general and common training which it is the function of a core curriculum to supply. Progressive organization of courses demands, first, that the introductory courses be required in the seventh and eighth years and, second, that the finishing courses be required in the ninth year. The introductory courses have been largely incorporated into the core curriculums of the seventh and eighth years in all of the fourteen centers. But the later courses which round out and complete the progressive organization of required subjects have generally been offered as electives rather than as constants.

The full contribution of a reconstructed core curriculum to pupil training is dependent on the principle of continuity applied in the progressive organization of each required subject. The present administration of electives in the fourteen centers investigated is controlled by a condition which is not a part of the 6-3-3 plan. The ninth year is not permitted to be the finishing year of the junior high school program of studies but continues to be the initial year of the senior high school program of studies.

TABLE XIV

Number of Centers Allotting One-fourth Year, One-half Year, and One Year to Each Elective in Each Grade

	Art	Commercial Education	English	Home Economics	Industrial Arts	Latin	Mathematics	Modern Languages		Music	Science	Social Studies
								French	Spanish			
Grade 7:												
¼ year..	1	1	1	2	1	.....	.....	.....	.....	1	1	.....
½ year..	.....	3	.....	2	2	2	.....	1	2	.....	.....	.....
1 year..	2	2	.....	2	5	2	.....	3	3	13	1	.....
Grade 8:*												
¼ year..	1	1	1	2	4	.....	.....	.....	.....	1	.....	.....
½ year..	.....	4	.....	4	2	1	.....	.....	.....	.....	1	.....
1 year..	4	7	.....	4	6	7	.....	8	5	10	.....	.....
Grade 9:												
¼ year..	.....	.....	.....	3	2	.....	.....	.....	.....	.....	.....	1
½ year..	.....	1	.....	6	2	.....	.....	.....	.....	.....	.....	5
1 year..	11	12	2	9	11	14	5	12	8	11	8	6

*Three of the co-operating school systems are organized on the 7-4 plan and do not have the usual eighth year. There are, therefore, only eleven centers reporting for this year.

Table XIV shows certain facts with regard to the length and distribution of the courses offered as electives. The difference between the figures in Tables XIII and XIV is accounted for by the fact that some centers offer electives for different portions of the school year in a given subject. The following is a descriptive account of the kinds of courses included under the general headings in Tables XIII and XIV. The figures following the names of the courses indicate the number of the fourteen centers which offer the respective courses in the given year. Further details as to the length of the courses in weeks and the aggregate number of minutes a week will be given in a subsequent chapter.

Commercial education.—Seventh year: business arithmetic, 2; business forms, 1; business writing, 2; stenography, 1; typewriting, 6. Eighth year: bookkeeping, 2; business arithmetic, 2; business practice, 3; business writing, 2; commercial geography, 1; elements of business, 1; stenography, 1; typewriting, 8. Ninth year: bookkeeping, 10; business writing and spelling, 5; commercial arithmetic, 4; commercial geography, 1; first lessons in business and office practice, 2; stenography, 4; typewriting, 9.

Home economics.—Seventh year: clothing, 4; foods, 4; home and family, 2; textiles, 1. Eighth year: clothing, 8; foods, 7; home and family, 4; millinery, 2; textiles, 1. Ninth year: clothing, 13; foods, 10; home and family, 7; millinery, 2; textiles, 1.

Industrial arts.—Seventh year: cafeteria, 1; general shop, 1; mechanical drawing, 2; metal-work, 2; printing, 3; reed work, 1; woodwork, 4. Eighth year: art needle-work, 1; auto mechanics, 2; bookbinding, 1; cafeteria, 1; commercial art, 1; drafting, 1; electricity, 7; forge, 1; home mechanics, 2; machine shop, 2; mechanical drawing, 4; metal-work, 4; printing, 8; reed work, 1; wood-finishing and sign-painting, 1; wood-turning, 1; woodwork, 4. Ninth year: art needle-work, 1; auto mechanics, 1; cabinet-making, 2; cafeteria, 1; commercial art, 1; drafting, 2; electricity, 4; forge, 1; home mechanics, 2; machine shop, 3; mechanical drawing, 10; metal-work, 5; pattern-making, 2; printing, 6; reed work, 1; wood-finishing and sign-painting, 1; wood-turning, 1; woodwork, 10.

Science.—Seventh year: elementary natural science, 1; general science, 1. Eighth year: elementary physical science, 1. Ninth year: botany, 1; general biology, 1; general science, 7; physiology, 1.

Social studies.—Ninth year: ancient history and Greek history, 3; citizenship, 1; community civics, 2; current events, 1; current world history, 1; economic civics, 2; European history, 2; international relations, 1; political civics, 1; Roman history, 1; vocational civics, 2.

It seems proper to offer a suggested program for the reconstruction of the curriculum of Grades 7, 8, and 9 in the light of tendencies and needs as revealed by present practices. As has been previously stated in this chapter, the principle of variety has been fully recognized in the reconstruction of the junior high school program of studies. It has produced general courses for exploratory purposes in the seventh and eighth years, and it has developed a system of differentiation in the eighth and ninth years which is today adequate to supply greater flexibility in curriculum choices. Electives should not be offered as substitutes for desirable constants; they should supplement required courses by providing fuller opportunity to specialize. There should be both required courses and elective courses for the ninth year in industrial arts, home economics, music, and art—the former to complete the progressive development of the arts courses in the general training of all pupils, the latter to fill the needs of the pupils who elect to specialize in the arts.

Science and social studies should be included with English, mathematics, and health as constants in all three years. There are, therefore, six general constants in the program of studies, each of which should be given throughout the seventh, eighth, and ninth years, namely, English, mathematics, science, social studies, health, and fine and practical arts.

TABLE XV

ARTICULATION OF THE PROGRAMS OF SOCIAL ACTIVITIES AND GUIDANCE WITH THE SIX GENERAL UNITS IN THE CONSTRUCTION OF A CONTINUOUS AND PROGRESSIVE CORE CURRICULUM IN THE SEVENTH, EIGHTH, AND NINTH YEARS

Health	Social activities
English	
General mathematics	
Social studies	Guidance
Natural science	
Fine and practical arts	

There remain in the program of studies the electives of foreign languages, commercial education, and vocational courses. Space does not permit a discussion of these electives at this point; a full statement will be given in a later chapter. Tables XV, XVI, and XVII, which were included in a report to the National Council of Education at the Cleveland meeting of the Department of Superintendence in February, 1923, will indicate the probable reconstruction of the junior high school program of studies. This report was published in part in the *School Review*.[1]

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[1] James M. Glass, "The Reorganization of the Seventh, Eighth, and Ninth Grades—Program of Studies," *School Review*, XXXI (September, 1923), 518–32.

TABLE XVI

THE SIX CONSTANTS, ARTICULATED PROGRAMS OF SOCIAL ACTIVITIES AND GUIDANCE, AND ELECTIVES DISTRIBUTED IN A WEEKLY SCHEDULE OF THIRTY ONE-CLOCK-HOUR PERIODS

Prior to Initial Electives*		Periods	Following Initial Electives	
Health	3	1	Health	3
		2		
		3		
English	5	4	English	4
		5		
		6		
		7		
		8	General mathematics	4
General mathematics	5	9		
		10		
		11		
		12	Social studies	4
		13		
Social studies	4	14		
		15		
		16	Science	3
		17		
Natural science and geography	4	18		
		19	Fine and practical arts†	4
		20		
		21		
Fine and practical arts†	5	22		
		23	Social activities	3
		24		
		25		
		26	Elective	5
Social activities	3	27		
		28		
		29		
Guidance	1	30		

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* The period prior to the selection of electives is most frequently the seventh year; the period following includes the eighth and ninth years. It is the writer's judgment that the two periods should each comprise three semesters or one and one-half years.

† Art, music, industrial arts, and home economics.

TABLE XVII

ELECTIVES

CURRICULUM	ELECTIVE COURSES*	
	Eighth Year or Second Semester of Eighth Year	Ninth Year
Academic	Foreign language	Foreign language
Fine arts	Art or music	Art or music
Technical (engineering courses)	Shopwork or home economics	Shopwork or home economics
Commercial	Junior business training	Junior business training Typewriting Bookkeeping
Vocational (trade courses)	Vocational industrial or household arts —half time	Vocational industrial or household arts —half time

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* Five periods a week for each elective or group of electives except in the case of the vocational curriculum, which on the Smith-Hughes basis requires one-half of the school day, that is, three hours a day.

CHAPTER IV

THE CORE CURRICULUM

This chapter reports the length of the school day and the time allotted to the constants of the curriculum in Grades 5, 6, 7, 8, and 9 in the school systems co-operating in this investigation.

The fourteen school systems participating in the investigation are variously organized. Ten are organized on the 6-3-3 plan. Three—Atlanta, Birmingham, and Kansas City—are organized on the 7-4 plan; and one, Okmulgee, on the 6-6 plan.

Table XVIII shows the length of the school day in minutes. The figures representing the longest and the shortest school days are repeated at the end of the table in order to make the contrast as clear as possible. Thus in the fifth grade the school system which has the longest school day is Detroit with 360 minutes; the school system which has the shortest school day is Decatur with 270 minutes.

TABLE XVIII

LENGTH OF SCHOOL DAY IN MINUTES*

City	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
Atlanta	330	330	330	X†	330
Berkeley	300	300	330	330	330
Birmingham	300	300	300	X	300
Cleveland	330	330	360	360	360
Decatur	270	285	285	340	340
Denver	300	300	360	360	360
Detroit	360	360	360	360	360
Kansas City	345	345	250‡	X	250‡
Los Angeles	280	280	270	270	270
Okmulgee	345	345	400	400	400
Pittsburgh	340	340	345	345	345
Rochester	345	345	360	360	360
St. Louis	315	315	315	315	315
Somerville	300	300	285	285	285
Highest	360	360	400	400	400
Lowest	270	280	270	270	270
Average	319	320	325	339	329

* Noon recess or luncheon period not included.

† X means that the school system is organized on the 7-4 plan and does not include an eighth grade.

‡ On account of congestion in the secondary schools, the junior high schools of Kansas City have a single session, 12:50 to 5:00 P.M. Because of this fact Kansas City is not recorded as having the shortest school day.

Some of the reasons for the increase in the length of the elementary-school day become apparent if one studies this table carefully. It is significant that in the junior high school centers the school day in the seventh grade is very commonly longer than the school day in the sixth grade. This fact is undoubtedly due to the effort made in the junior high school to introduce certain new forms of training, such as physical education, gymnasium work, health education, practical arts, and a varied program of social activities. These additions to the curriculum demand time, and the time cannot be secured in the ordinary school program; hence there is a tendency to increase the length of the school day in order to provide the time necessary for these additional activities.

A distinction has also been made in many cases between prepared and unprepared work. It is the judgment of the administrators and teachers in the centers investigated that they can legitimately lengthen the school day where there is an increase in the amount of unprepared work. The net result of the variation in the method of instruction has been, therefore, to increase the length of the school day.

Table XIX gives the number of minutes a week allotted to each required subject or constant. Table XX gives the proportional allotment of the school week to the constants. Table XIX is on an absolute basis, Table XX on a relative basis. The following abbreviations are used in these and later tables to indicate the school systems included in the investigation: Atl. (Atlanta); Ber. (Berkeley); Bir. (Birmingham); Cle. (Cleveland); Dec. (Decatur); Den. (Denver); Det. (Detroit); K.C. (Kansas City); L.A. (Los Angeles); Okm. (Okmulgee); Pit. (Pittsburgh); Roc. (Rochester); St. L. (St. Louis); and Som. (Somerville).

It may be noted again at this point that in computing averages the practice has been adopted throughout this report of averaging only the cases where the subject is actually given. Thus, in the fifth grade there are only eight of the fourteen school systems which give courses in industrial arts; in making up the average, the sum of the various numbers of minutes reported in Table XIX is divided by eight. Furthermore, in reporting the lowest number of minutes devoted to the subject, reference is made only to those cases in which the subject is actually required. It would be legitimate to make up a table in such form as to emphasize the fact that the smallest number of minutes devoted to industrial arts in some of the schools is zero, but the case is clear enough if the positive returns only are referred to in the summary tables.

For the readers who do not care to study the details of Tables XIX and XX, a few general comments are here given, followed by more

TABLE XIX

Number of Minutes a Week Allotted to Constants

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Art:																	
Grade 5	60	90	60	125	80	90	60	30	90	125	80	75	90	60	125	30	79.6
Grade 6	60	90	60	125	100	90	60	30	70	90	80	75	90	60	125	30	77.1
Grade 7	60	100	60	90	50	100	60	E*	210	E	55	75	75	60	210	50	82.9
Grade 8	X†	100	X	90	50	100	60	X	210	E	55	75	50	60	210	50	85.0
Grade 9	.....	E	E	E	E	100	60	E	200	E	E	120	E	.....	200	60	120.0
English:																	
Grade 5	375	475	345	475	225	423	500	460	425	475	470	375	375	420	500	225	415.6
Grade 6	375	475	375	475	225	366	500	445	425	400	445	375	355	420	500	225	404.0
Grade 7	375	200	400	347	320	375	300	250	393	275	275	300	260	180	400	180	303.6
Grade 8	X	200	X	225	320	250	240	X	435	275	220	300	260	240	435	200	269.5
Grade 9	200	200	225	225	300	250	240	250	420	275	275	300	260	300	420	200	265.7
Geography:																	
Grade 5	150	120	125	187	150	185	‡	250	250	62	100	225	120	150	250	62	159.5
Grade 6	150	120	125	200	150	184	‡	300	250	75	100	225	120	150	300	75	165.3
Grade 7	150	.....	60	225	250	125	‡	E	210	56	220	80	§	180	250	56	155.6
Grade 8	X	.....	X	.....	.....	125	‡	X	.....	56	.....	.....	§	180	180	56	120.3
Health:																	
Grade 5	125	150	150	140	175	130	290	160	125	250	280	145	60	260	290	60	174.3
Grade 6	125	150	75	140	175	130	260	160	125	180	280	145	60	230	280	60	159.6
Grade 7	125	200	75	135	150	100	300	125	200	275	120	60	104	135	300	60	150.3
Grade 8	X	200	X	135	102	100	300	X	200	275	120	60	52	135	300	52	152.6
Grade 9	40	200	E‖	90	E¶	100	300	250	200	275	120	60	104	75	300	40	151.2

* E means that electives are offered.

† X means that the school system is organized on the 7-4 plan and does not include an eighth grade.

‡ See social studies.

§ In St. Louis geography is correlated with history and vocational civics in Grades 7, 8, and 9.

‖ Birmingham reports that hygiene is included in general science. An elective in physical education of 225 minutes a week is offered in the first year of the high school.

¶ Decatur reports that hygiene is taught by the home-room teachers, who use a course of study prepared under the direction of the supervisor of health. An elective in hygiene of 100 minutes a week is also offered. A course in home hygiene is offered to ninth-year girls by the school nurse.

TABLE XIX—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Home economics:																	
Grade 5	.....	90	60	.....	.....	75	75	83	75	.....	*	150	.....	60	150	60	83.5
Grade 6	.....	90	60	.....	.....	90	105	165	75	.....	*	150	.....	60	165	60	99.4
Grade 7	†	100	60	180	100	260	300	E	200	E	220	180	260	120	300	60	180.0
Grade 8	X	100	X	180	100	130	120	X	200	E	E	180	52	120	200	52	131.3
Grade 9	E	E	E	E	E	E	120	E	E	550	E	180	E	E	550	120	283.3
Industrial arts:																	
Grade 5	.....	90	60	.....	.....	90	90	180	90	.....	75	75	.....	.....	180	60	93.8
Grade 6	.....	90	60	.....	.....	90	90	180	90	.....	150	75	.....	60	180	60	98.3
Grade 7	†	170	60	225	100	250	300	E	210	275	150	180	130	60	300	60	175.8
Grade 8	X	170	X	270‡	100	125‡	120‡	X	210	275	180‡	180‡	E	60	275	60	169.0
Grade 9	†	E	225	E	E	E	120‡	E	210	E	180‡	180‡	E	E	225	120	183.0
Mathematics:																	
Grade 5	150	200	300	225	125	205	250	250	175	175	150	250	150	250	300	125	203.9
Grade 6	150	200	275	225	125	205	250	250	175	175	150	250	120	250	275	120	200.0
Grade 7	150	200	275	225	250	250	240	250	200	275	275	300	264	180	300	150	238.1
Grade 8	X	200	X	225	250	250	240	X	200	275	275	300	260	180	300	180	241.4
Grade 9§	400	E	450	225	E	250	300	E	200	E	275	300	E	285	450	200	298.3
Music:																	
Grade 5	75	150	70	75	80	97	60	100	60	130	100	100	80	60	150	60	88.4
Grade 6	75	150	70	75	100	102	60	100	60	130	100	100	80	60	150	60	90.1
Grade 7	75	90	70	45	50	52	60	E	80	90	100	60	78	60	100	45	70.0
Grade 8	X	90	X	45	50	52	60	X	80	90	75	90	52	60	90	45	67.6
Grade 9	45	90	E	90	100	52	60	E	E	E	E	60	104	60	104	45	73.4

* The East Street Platoon School reports home economics omitted in the term for which data were supplied.

† Atlanta reorganized its 7-4 system on the 6-3-3 basis in September, 1923, provision being made for practical arts in all of the junior high schools.

‡ The time allotment for industrial arts varies with the different curriculums. The time allotment of the general or academic curriculum is here given.

§ Where an elective is indicated there is an option of several mathematics courses; that is, mathematics is required in each curriculum. Because the time varies in the different curriculums, the time allotment is not given.

TABLE XIX—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Science:																	
Grade 5	90	30	.....	.....	.....	20	.....	.....	90	100	120	.....	.....	30	120	20	68.6
Grade 6	90	30	150	.....	.....	21	.....	.....	90	100	120	.....	30	30	150	21	73.4
Grade 7	90	200	.....	.....	.....	.....	120	.....	*	†	.....	120	130	.....	200	90	132.0
Grade 8	X	200	X	.....	250	.....	120	X	‡	†	120	120	260	.....	260	120	178.3
Grade 9	§	.....	225	E	E	E	120	E	E	E	E	240	E	.....	240	120	195.0
Social studies:																	
Grade 5	.....	150	125	125	150	‖	250	¶	**	150	90	50	75	60	250	50	122.5
Grade 6	225	175	225	125	150	‖	250	¶	**	150	140	50	75	60	250	50	147.7
Grade 7	250	200	275	180	250	250	300	250	210	305	220	300	260	180	305	180	245.0
Grade 8	X	200	X	225	250	250	210	X	294	305	220	240	260	180	305	180	239.5
Grade 9	.....	200	E	E	E	E	300	E	210	55	E	120	260	60	300	55	172.1

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* Part of geography.

† Okmulgee offers elementary natural science in the seventh and eighth years as finding and broadening courses; the finding and broadening courses in all subjects are elective.

‡ Part of health.

§ Atlanta gives a required course in general science in the second year of the high school.

‖ Denver reports as follows with regard to the correlation of history and civics with geography: "A close connection is made in the fifth grade between geography and history, topics being assigned for places of historical interest. Civics is given irregularly in the English work of the fifth and sixth grades"

¶ Kansas City reports as follows: "Work in citizenship is done in a Junior Citizens' Club formed in each room. Safety work is done largely through room representatives in a School Safety Council which co-operates with a city organization."

** In Los Angeles, geography, history, and civics are combined into a social science unit which is included in this report under geography.

TABLE XX

PROPORTIONAL ALLOTMENT OF THE SCHOOL WEEK TO CONSTANTS

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Art:																	
Grade 5	3.6	6.0	4.0	7.6	5.9	6.0	3.3	1.7	6.4	7.2	4.7	4.3	5.7	4.0	7.6	1.7	5.0
Grade 6	3.6	6.0	4.0	7.6	7.0	6.0	3.3	1.7	5.0	5.2	4.7	4.3	5.7	4.0	7.6	1.7	4.9
Grade 7	3.6	6.1	4.0	5.0	3.5	5.6	3.3	E*	15.6	E	3.2	4.2	4.8	4.2	15.6	3.2	5.3
Grade 8	X†	6.1	X	5.0	2.9	5.6	3.3	X	15.6	E	3.2	4.2	3.2	4.2	15.6	2.9	5.3
Grade 9	.....	E	E	E	E	5.6	3.3	E	14.8	E	E	6.7	E	.....	14.8	3.3	7.6
English:																	
Grade 5	22.7	31.7	23.0	28.8	16.7	28.2	27.8	26.7	30.4	27.5	27.6	21.7	23.8	28.0	31.7	16.7	26.0
Grade 6	22.7	31.7	25.0	28.8	15.8	24.4	27.8	25.8	30.4	23.2	26.2	21.7	22.5	28.0	31.7	15.8	25.3
Grade 7	22.7	12.1	26.7	19.3	22.5	20.8	16.7	20.0	29.1	13.8	15.9	16.7	16.5	12.6	29.1	12.1	19.0
Grade 8	X	12.1	X	12.5	18.8	13.9	13.3	X	32.2	13.8	12.8	16.7	16.5	16.8	32.2	12.1	16.3
Grade 9	12.1	12.1	15.0	12.5	17.6	13.9	13.3	20.0	31.1	13.8	15.9	16.7	16.5	21.1	31.1	12.1	16.5
Geography:																	
Grade 5	9.1	8.0	8.3	11.3	11.1	12.3	.....	14.5	17.9	3.6	5.9	13.0	7.6	10.0	17.9	3.6	10.2
Grade 6	9.1	8.0	8.3	12.1	10.5	12.3	.....	17.4	17.9	4.3	5.9	13.0	7.6	10.0	17.9	4.3	10.5
Grade 7	9.1	.....	4.0	12.5	17.5	6.9	.....	E	15.5	2.8	12.8	4.4	.....	12.6	17.5	2.8	9.8
Grade 8	X	.....	X	.....	.....	6.9	.....	X	.....	2.8	.....	.....	.....	12.6	12.6	2.8	7.4
Health:																	
Grade 5	7.6	10.0	10.0	8.5	13.0	8.7	16.1	9.3	8.9	14.5	16.5	8.4	3.8	17.3	17.3	3.8	10.9
Grade 6	7.6	10.0	5.0	8.5	12.3	8.7	14.4	9.3	8.9	10.4	16.5	8.4	3.8	15.3	16.5	3.8	9.9
Grade 7	7.6	12.1	5.0	7.5	10.5	5.6	16.7	10.0	14.8	13.8	7.0	3.3	6.6	9.5	16.7	3.3	9.3
Grade 8	X	12.1	X	7.5	6.0	5.6	16.7	X	14.8	13.8	7.0	3.3	3.3	9.5	16.7	3.3	9.1
Grade 9	2.4	12.1	E	5.0	E	5.6	16.7	20.0	14.8	13.8	7.0	3.3	6.6	5.3	20.0	2.4	9.4
Home economics:																	
Grade 5	.....	6.0	4.0	.....	.....	5.0	4.2	4.8	5.4	.....	.....	8.7	.....	4.0	8.7	4.0	5.3
Grade 6	.....	6.0	4.0	.....	.....	6.0	5.8	9.6	5.4	.....	.....	8.7	.....	4.0	9.6	4.0	6.2
Grade 7	.....	6.1	4.0	10.0	7.0	14.4	16.7	E	14.8	E	12.8	10.0	16.5	8.4	16.7	4.0	11.0
Grade 8	X	6.1	X	10.0	5.9	7.2	6.7	X	14.8	E	E	10.0	3.3	8.4	14.8	3.3	8.0
Grade 9	E	E	E	E	E	E	6.7	E	E	27.5	E	10.0	E	E	27.5	6.7	14.7

* E means that electives are offered.

† X means that the school system is organized on the 7-4 plan and does not include an eighth grade.

TABLE XX—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Industrial arts:																	
Grade 5	.....	6.0	4.0	.....	.....	6.0	5.0	10.4	6.4	.....	4.4	4.3	.....	.....	10.4	4.0	5.8
Grade 6	.....	6.0	4.0	.....	.....	6.0	5.0	10.4	6.4	.....	8.8	4.3	.....	4.0	10.4	4.0	6.1
Grade 7	.....	10.3	4.0	12.5	7.0	13.9	16.7	E	15.6	13.8	8.7	10.0	8.3	4.2	16.7	4.0	10.4
Grade 8	X	10.3	X	15.0	5.9	6.9	6.7	X	15.6	13.8	10.4	10.0	E	4.2	15.6	4.2	9.9
Grade 9	.....	E	15.0	E	E	E	6.7	E	15.6	E	10.4	10.0	E	E	15.6	6.7	11.5
Mathematics:																	
Grade 5	9.1	13.3	20.0	13.6	9.3	13.7	13.9	14.5	12.5	10.1	8.8	14.5	9.5	16.6	20.0	8.8	12.8
Grade 6	9.1	13.3	18.3	13.6	8.8	13.7	13.9	14.5	12.5	10.1	8.8	14.5	7.6	16.6	18.3	7.6	12.5
Grade 7	9.1	12.1	18.3	12.5	17.5	13.9	13.3	20.0	14.8	13.8	15.9	16.7	16.8	12.6	20.0	9.1	14.8
Grade 8	X	12.1	X	12.5	14.7	13.9	13.3	X	14.8	13.8	15.9	16.7	16.5	12.6	16.7	12.1	14.3
Grade 9	24.2	E	30.0	12.5	E	13.9	16.7	E	14.8	E	15.9	16.7	E	20.0	30.0	12.5	18.3
Music:																	
Grade 5	4.5	10.0	4.7	4.5	5.9	6.5	3.3	5.8	4.3	7.5	5.9	5.8	5.1	4.0	10.0	3.3	5.6
Grade 6	4.5	10.0	4.7	4.5	7.0	6.8	3.3	5.8	4.3	7.5	5.9	5.8	5.1	4.0	10.0	3.3	5.7
Grade 7	4.5	5.5	4.7	2.5	3.5	2.9	3.3	E	5.9	4.5	5.8	3.3	5.0	4.2	5.9	2.5	4.3
Grade 8	X	5.5	X	2.5	2.9	2.9	3.3	X	5.9	4.5	4.3	5.0	3.3	4.2	5.9	2.5	4.0
Grade 9	2.7	5.5	E	5.0	5.9	2.9	3.3	E	E	E	E	3.3	6.6	4.2	6.6	2.7	4.4
Science:																	
Grade 5	5.5	2.0	.....	.....	.....	1.3	.....	.....	6.4	5.8	7.1	.....	.....	2.0	7.1	1.3	4.3
Grade 6	5.5	2.0	10.0	.....	.....	1.4	.....	.....	6.4	5.8	7.1	.....	1.9	2.0	10.0	1.4	4.7
Grade 7	5.5	12.1	.....	.....	.....	.....	6.7	.....	.....	E	.....	6.7	8.3	.....	12.1	5.5	7.9
Grade 8	X	12.1	X	.....	14.7	.....	6.7	X	.....	E	7.0	6.7	16.5	.....	16.5	6.7	10.6
Grade 9	.....	.....	15.0	E	E	E	6.7	E	E	E	E	13.3	E	.....	15.0	6.7	11.7
Social studies:																	
Grade 5	.....	10.0	8.3	7.6	11.1	.....	13.9	.....	.....	8.7	5.3	2.9	4.8	4.0	13.9	2.9	7.7
Grade 6	13.6	11.7	15.0	7.6	10.5	.....	13.9	.....	.....	8.7	8.2	2.9	4.8	4.0	15.0	2.9	9.2
Grade 7	15.2	12.1	18.3	10.0	17.5	13.9	16.7	20.0	15.6	15.3	12.8	16.7	16.5	12.6	20.0	10.0	15.2
Grade 8	X	12.1	X	12.5	14.7	13.9	11.7	X	21.8	15.3	12.8	13.3	16.5	12.6	21.8	11.7	14.3
Grade 9	.....	12.1	E	E	E	E	16.7	E	15.5	2.8	E	6.7	16.5	4.2	16.7	2.8	10.6

elaborate comments for the subject specialists who are interested in the details of practice.

GENERAL DISCUSSION OF TABLES XIX AND XX

Art.—It will be noted that in each school system the amount of time allotted to art during the fifth and sixth years is approximately uniform. The practices of the seventh, eighth, and ninth years in some instances show a radical departure from the practices of the earlier years. This is especially true of the ninth year where the work is usually elective.

Attention was called in chapter iii to the fact that the junior high school program has, in general, failed to modify to any great extent the practices in the ninth year. The ninth year continues to be the first high-school year, and all of its practices are determined by the demands of the senior high school program rather than by the demands of the junior high school program. It is perfectly evident that the work in art which is carried on in most of these school systems throughout the elementary-school grades is not continued in the junior high school program of the ninth year.

English.—Special attention may be called to the fact that in English, even though it is a universally accepted part of the school program, there is the widest variation. If one notes the maximum and the minimum number of minutes a week allotted to this subject in the seventh grade, one has an extreme illustration of this variation. It can hardly be believed that the same practical results issue from 400 minutes devoted to English in Birmingham and 180 minutes in Somerville. It is possible that the school systems which devote the least time to English have provided substitutes for this subject. Thus it will be noted that Somerville, which has a short English program in the seventh year, has a relatively long program in the years immediately preceding. The probabilities are that in organizing the seventh year the pressure from other subjects has made it seem desirable to the authorities in that school system to curtail for a single year the work in English. There will be given in a later chapter of this report some indication of the particular English subject divisions which are emphasized in the different years. Further explanation of the gross variations in time will be found in the details there presented.

Geography.—Geography has traditionally been excluded from the American high-school program. In Europe one finds geography included as a part of the curriculum of the higher institutions. In America even the eighth grade very seldom includes this subject. The common practice is to substitute history or some of the social studies for geography, which is usually included in the programs of the lower grades. It will be noted that this practice has gone so far in the case of Detroit as to require an entirely separate treatment of the geography work, and it will be noted also that in Berkeley even the seventh grade does not include regular work in geography. It is not surprising under these conditions to find that the variations in the amount of time given to this subject are extreme. Even though the subject is one of the commonly recognized factors of the elementary-school curriculum, there is wide variation in its contents and in its location in the school in the different centers. That the subject-matter is of general significance is clearly recognized in all of the educational literature of the day, but it is equally clear from the facts presented that there is no agreement as to the extent to which this material is regarded as important or as to its proper location in the school.

Health.—Tables XIX and XX reveal the fact that a relatively large amount of time is being devoted to systematic instruction on health. Much of the work in hygiene and physiology is of a practical sort; much of it, on the other hand, is of a distinctly scientific type. In the latter respect health instruction supplements the sciences. Both laboratory and textbook work are therefore possible.

In nearly all of the centers there is confusion regarding the responsibility for health instruction or, more strictly speaking, for hygiene instruction. This work is being given by health teachers, science teachers, and teachers of the social studies. Certain phases of health instruction may properly be delegated to each of these three groups of teachers. Frequently, however, the practice of delegating to several people the duty of teaching hygiene results in a loss of instructional time because of the lack of clear distinctions in the division of instructional materials. The situation might be more effectively administered if the responsibility for the proper articulation of health teaching by the three groups of teachers were definitely assigned to a health director.

Home economics.—In the case of home economics there appears greater irregularity than in the case of any of the constants previously discussed. Several of the school systems give no work at all in this subject in the lower grades, and the characteristic conservatism of the ninth year appears in very definite form in the fact that home economics is elective rather than required.

Attention should be called to the fact that it is only within recent years that the fifth and sixth grades have included instruction in practical subjects. The relatively large number of centers reported as having courses in home economics is impressive in spite of the number of school systems which do not include this subject.

Industrial arts.—In the case of industrial arts, as in the case of home economics, there are a number of the school systems which have not introduced the work into the lower grades, and the ninth year includes this type of instruction largely on an elective basis. In many instances this work is for the boys and serves for them the same purpose that home economics does for the girls. If the school systems of the country at large were examined and the figures for the small towns as well as for the large cities were included in this report, there would undoubtedly be much greater variation than is here shown.

The work in industrial arts requires certain accommodations and equipment which are very frequently lacking in small school systems. It should be remembered in general, in studying the figures here presented, that all of the school systems under investigation are exceptionally well equipped. Where they show variation, therefore, in such subjects as industrial arts, it must be recognized that the variations arise from differences in the views of administrators with regard to the educational importance of the subject. It is only here and there that the limitation can be attributed in any wise to lack of equipment or to lack of training on the part of the teachers.

Mathematics.—Under mathematics are included various branches of the mathematical sciences. In the fifth and sixth grades the work is exclusively in arithmetic. In the upper grades there is variation in the subjects of instruction. The seventh and eighth years sometimes include a great deal of arithmetic and sometimes general mathematics. In other instances these years give instruction in algebra and geometry. Especially in those school systems which have adopted the junior high school program is it common for the seventh and eighth years to deal with subjects that were frequently dealt with exclusively in the high school. Later tables will bring out the details of this variation. It will be pointed out, for example, that six centers include intuitive geometry with arithmetic in the seventh year, that two centers in the seventh year and five centers in the eighth year include algebra with arithmetic, and that one center in the eighth year requires algebra and geometry but not arithmetic. The variations, therefore, are not merely variations in the amount of time devoted to mathematics but further variations among the subdivisions of the subject.

The variation in practice in the ninth year of the fourteen centers challenges serious attention. While general mathematics, as has been pointed out, frequently appears in the seventh and eighth years, there is an abrupt abandonment in the ninth year of all of the tendencies toward the reconstruction of mathematics and a return to the course in algebra of the traditional type commonly required for college admission. The net result of such conservatism in the ninth year must be a loss in the gains which have been made by the reconstruction of the program in the years immediately preceding.

Music.—The impressive fact brought out by the time allotments to music is the relatively small amount of time that is given to this subject and the constancy with which it appears in the programs up to the ninth year. There is no great divergence in practice with regard to this subject, simply because it consumes a relatively small part of the programs investigated. It is one of the newer subjects of instruction in the elementary and junior high schools and has apparently not become a strong competitor of any of the traditional subjects.

Science.—The time allotments to science are impressive because of the relatively small amount of required science which has succeeded in establishing itself in the various school systems investigated. It is evident that the movement has not succeeded which a few years ago undertook to introduce nature-study as a constant in elementary-school programs. On the other hand, the evidence is clear that the junior high school now gives promise of adding science to the constants of the programs of study in at least Grades 7, 8, and 9.

Social studies.—It is evident that there is a growing tendency to include social studies in the core curriculums of the seventh and eighth years. Geography is combined in some quarters with the work in social science. The other topics which appear in this group of subjects will be described in detail in connection with later tables. It is not at all uncommon to devote at least one period a week to the study of current events. Civics is sometimes combined with English, and in some instances history has been modified by the introduction of topics other than the traditional topics of the history course.

DETAILED DISCUSSION OF TABLES XIX AND XX

The remaining pages of this chapter will be devoted to a detailed discussion of Tables XIX and XX. It is likely that these details will interest chiefly supervisors and teachers dealing specifically with given subject fields.

An examination of the tables makes it possible for one to discover certain trends in the curriculum of the junior high school. The practices of the elementary school of the older type, that is, the elementary school in the 8-4 plan of school organization, may be taken as the basis of comparison. Wherever a majority of the centers investigated depart from these earlier practices it may be said that the curriculum has been modified and a new practice established. Where less than a majority have adopted a new plan of procedure, it may be said that a tendency appears rather than an established practice. In the discussion which follows it will be pointed out that tendencies are appearing wherever three or more centers have adopted a given plan of organization.

By way of illustration of tendencies we may cite the not infrequent introduction into the core curriculum of the ninth year of such subjects as science and the practical arts. Less than one-half of the centers include these subjects among the constants, but they appear so frequently that it is proper to say that there is a well-established tendency in the direction of their adoption.

ART

There is little variation in the amount of time allotted to art education in the fifth, sixth, seventh, and eighth years. The average for each of the four years is approximately 80 minutes a week. In the ninth year the required art in the four centers which include art among the constants in this year averages two hours a week. Art or drawing is a required subject in the fifth and sixth years of all centers and in the seventh year of twelve of the fourteen centers. In the eighth year art is a required subject in ten of the eleven centers which include an eighth year. It is, however, a required subject in only four of the fourteen centers in the ninth year. There is evident, therefore, a persistence of the former practice of requiring art in the elementary school in Grades 1 to 8 and of making it an elective in the high school. Even the reorganization of the junior high school has not resulted, except in four centers, in carrying art as a required subject into the ninth year. It does, however, appear as an elective in the ninth year in all but two of the ten remaining centers.

There is a difference of approximately one and one-half hours a week between the highest and the lowest time allotments in the fifth and sixth years. The experimental reorganization of the seventh, eighth, and ninth years has resulted in variation in time allotments to the extent of two and two-thirds hours a week in the seventh and eighth years and two and one-third hours a week in the ninth year. There is thus seen to be wide and variable experimentation with required art work in the junior high school years.

If the principle of continuity of courses of study is to prevail in the junior high school, then art should continue as a constant in the ninth year. Traditional practice, which persists unfortunately in determining the curriculum of the ninth year, should be altered to the end that the ninth year may become an integral part of the junior high school. College-entrance requirements which are based on four years of secondary-school work result in classifying the ninth year as the first year of the high school. The curriculum of the junior high school cannot be determined by college-entrance requirements if the junior high school is to serve the interests of the great majority of its pupils who will not profit by college training.

Art does not appear as a required subject in the ninth year because college-admission requirements will not permit. Integration of courses of study in the junior high school will not be possible until accrediting relations are limited in 6-3-3 school systems to the senior high school. It is significant of a determination to adopt the principle of continuity and integration of courses of study in the junior high school that four school systems continue art as a required subject in the ninth year in spite of uncompromising college-entrance requirements. The alternative of other 6-3-3 systems which cannot provide time allotments for required art is either to offer art as an elective or to include it among the club activities.

English

As would be expected, English is required in each of the fourteen centers in each of the five years covered by the investigation. Also, as would be expected, the time allotments are greater in the elementary-school years than in the junior high school years. The progress from the basal subjects of the elementary school through the enriched curriculums of the intermediate school to the differentiated curriculums and electives of the senior high school should be accompanied by gradually diminishing time allotments to basal subjects and by gradually increasing time allotments to electives. The proper articulation of elementary and secondary courses of study should reveal a gradual transition from exclusively elementary to exclusively secondary education and not the abrupt transition which too frequently characterized the 8-4 organization. The progressively reduced time allotment to English in the fourteen centers from an average of 416 minutes a week in the fifth year to 266 minutes a week in the ninth year is evidence of this gradual transition.

The variation in the fifth year, a difference of almost five hours a week between the highest and the lowest time allotments, is partly balanced by the fact that there is a difference of exactly two hours between the lowest and the next lowest time allotments and by the further fact that in Decatur, which reports the lowest time allotment, there are in the junior high school years time allotments which exceed those of a large majority of the other centers. Virtually the same conditions prevail in the reports of the fifth and sixth years. Decatur reports in a supplementary note that the fifth- and sixth-year classes are divided into two sections, one devoted to recitation and the other to study, and that, therefore, the additional 150 minutes assigned to study should be added to the total time allotment. In other words, all centers actually report 345 or more minutes a week for English in the fifth and sixth years. Conditions with regard to racial inheritance, social environment, and home influence, which control time allotments to English, vary so greatly within different communities in large centers of population that comparisons are unwarranted. The first obligation of each school is to meet the needs for English training presented by its own pupils.

The average weekly time allotment to English is 100 minutes less in the seventh year than in the sixth year and 34 minutes more in the seventh year than in the eighth year. The junior high school provides for less total class time for English than the elementary school, but it counterbalances this reduction by a practice which is not evident in Table XIX, namely, the oral expression and English dramatic work which uniformly characterizes many of the extra-curricular activities—assembly programs, class meetings, debating clubs, dramatic clubs, etc. Practically all extra-curricular activities are supplementary agencies in oral English composition. This is particularly true when the activities are largely controlled and carried on by the pupils.

The proportional allotments of the school week to English vary from 12.1 to 29.1 in the seventh year, from 12.1 to 32.2 in the eighth year, and from 12.1 to 31.1 in the ninth year. However, a reorganization as experimental and as recent as the junior high school should not be expected within a brief period of fifteen years to determine definite time allotments. The variation, furthermore, is about equal to the variation in the elementary years where greater standardization of practice might be expected to prevail.

GEOGRAPHY

Geography is a required subject in both the fifth and the sixth years of all fourteen centers. Detroit has a unified course in social science in these two grades and could not specify the time allotted to the geography, history, and civics units; the time allotment in this case is included in the time devoted to the social studies. In two centers the course in geography is completed at the end of the sixth year; in seven centers the course is dropped at the close of the seventh year; and in only five centers is geography continued as a required subject into the eighth year. In 64 per cent of the centers, therefore, geography is completed by the end of the seventh year.

Time allotments to geography in the fifth year vary from 62 to 250 minutes a week; in the sixth year, from 75 to 300 minutes; and in the seventh year, from 56 to 250 minutes. There is apparently serious difference of emphasis attached to the work in geography as evidenced by the proportional allotments of school time to the subject. In cases where political geography predominates as the materials of instruction, which is the practice in most centers, a low percentage of time allotment is probably warranted. In cases, however, where the social, industrial, commercial, economic, and scientific values of geography predominate, it is to be questioned whether a larger proportion of time should not be given to the subject. These values have been incorporated in many cases with other required subjects of study—community, vocational, and economic civics; science; and, to some extent, industrial arts—and in some instances with elective subjects—commercial geography, science, and industrial geography.

There is evident in this curriculum practice the necessity of extending the investigation in order to determine the extent to which geography should be merged with other social studies as part of a general social science course and also, so far as its science values are concerned, with courses in natural and general science. The tendency to fuse separate units of instruction into larger and more inclusive general subject units is prevalent, particularly in the junior high school centers. This tendency should be encouraged to the end that the junior high school may more effectively articulate the unassimilated units of instruction which it has inherited from the elementary school and the senior high school. There will continue to be waste of instructional time so long as needless overlapping of subject fields is permitted to continue. Articulation of units of instruction is an important problem of junior high school curriculum practice. In geography particularly there is wide variation in both practice and judgment with regard to the continued isolation of geography work or its articulation with social studies and science.

The average weekly time allotments to geography in the fifth, sixth, and seventh years are practically the same, being 160, 165, and 156 minutes, respectively. In the elementary school the weekly time allotment should probably be divided into daily periods of 30 to 35 minutes each. In the seventh year the weekly time allotment should be apportioned on the basis of daily periods of 30 to 35 minutes each or, in the usual case of six one-clock-hour periods daily, on the basis of three periods a week. In the latter case geography and science would alternate in the schedule of classes, that is, geography three periods a week and science two periods a week.

The question of continuing geography into the eighth year must, as judged from the practice evident in the fourteen centers investigated, be determined by the degree of completeness with which geography is taught in the grades preceding the eighth. The question of eighth-year geography as an isolated subject unit is to be answered partly on the basis of the type of social studies and science courses required in the eighth and ninth years.

Health

All of the fourteen centers include health as a required subject in the fifth, sixth, seventh, and eighth years. The average weekly time allotment is 174 minutes in the fifth year and 160 minutes in the sixth year. Ten centers give the same weekly time allotment to the sixth year that they give to the fifth year. The average weekly time allotment is a little less in the seventh year than in either the sixth year or the eighth year. The difference is too small to warrant any conclusion other than accidental and unavoidable exigencies of schedule-making. Rather, the nearly uniform practice of offering from two and one-half to three hours a week in health throughout the five years covered by the investigation indicates a country-wide determination to increase the proportion of school time allotted to health education. The American school system has already benefited by the experiences of the army in drafting millions of young men previously trained in the public schools.

In the fifth year one center allots 60 minutes a week to health. The next lowest time allotment is 125 minutes a week or twice the minimum allotment. Nine cities give between 125 and 200 minutes a week, and four give over 200 minutes. Approximately the same variation prevails in the sixth year. There are, however, four centers which reduce the weekly time allotment in the sixth year. There is a variation of 230 minutes a week or 13.5 per cent of the school week in the fifth year and of 220 minutes a week or 12.7 per cent of the school week in the sixth year. The amount of variation, therefore, approximates four hours a week.

The difference in physical-training facilities—gymnasium, playground, and equipment—probably explains to a large degree this widely varied practice. While it is true that the curriculums of the fifth and sixth years are the product of long experience, the condition of variation in these years is comparable to a similar condition prevailing in the junior high school years. The explanation undoubtedly lies in the fact that the time allotment to health has, in general, been increased in recent years. The variation is also explained in part by the fact that the old elementary-school buildings now in use are not equipped for physical education and, on the other hand, by the fact that most of the new elementary-school buildings contain adequate physical-training facilities. Furthermore, the practice of selecting a school site many times the size of the plots on which the old buildings were often constructed has developed within recent years. Playground activities consequently characterize a new trend in elementary education.

In the seventh, eighth, and ninth years there is a difference of four hours or more between the highest and the lowest weekly time allotments. This is equivalent to saying that in the junior high school years one center gives one hour a week and another center gives one hour a day. The average practice is two and one-half hours a week. Inasmuch as the great majority of the junior high schools are equipped with gymnasiums, either the physical-training facilities in some of the present junior high school buildings are wholly inadequate for the pupil enrolment or there is a surprising difference in the evaluation of health education. The latter is not probable in the case of either the elementary school or the junior high school in view of the emphatic lesson taught the public school system by the world-war.

The inference, therefore, seems clear that the variations in practice as revealed by Table XIX are due to the inadequacy of physical-training facilities. No criticism can be directed against school systems which are confronted by inadequate facilities because frequently the inadequacy cannot be corrected on account of old construction. However, serious criticism should be directed against school systems which fail in new building programs to provide gymnasiums, playgrounds, physical-training equipment, and well-trained instructors.

Junior high schools have generally been slow to appreciate the fact that the physiological development of the pubescent or early adolescent age demands an amount of health instruction and physical education far in excess of that required by either the elementary school or the senior high school. There are, however, among the fourteen centers four centers in which the proportional allotment of the school week to health education is fairly comparable to the proportional allotments to traditional major subjects. The eighth year is selected as typical of the junior high school practice. In Detroit the school time is divided as follows: 16.7 per cent for health, 13.3 per cent for English, 13.3 per cent for mathematics, and 11.7 per cent for social studies; in Los Angeles, 14.8 per cent for health, 32.2 per cent for English, 14.8 per cent for mathematics, and 21.8 per cent for social studies; in Okmulgee, 13.8 per cent for health, 13.8 per cent for English, 13.8 per cent for mathematics, and 15.3 per cent for social studies; and in Berkeley, 12.1 per cent for health, 12.1 per cent for English, 12.1 per cent for mathematics, and 12.1 per cent for social studies.

In these centers, therefore, there is evident a purpose to evaluate health education as a major subject in the core curriculum. The writer was informed by administrators in other centers that health would receive recognition as a major requirement in the junior high school program of studies when the number of rooms set aside for physical training and hygiene instruction could be made equal to the number of rooms provided for other major subjects. Apparently the facilities determine very largely the time allotments in the junior high school years.

Health education, to an extent prevailing in no other major subject except English, is carried into the ninth year as a required subject. In spite of the inhibiting influence of college-admission requirements on the operation of the principle of continuity in other required major subjects, the conviction that health should continue into the ninth year controls the practice in twelve of the fourteen centers. The average weekly time allotment is two and one-half hours a week. Probably the majority of all junior high schools will be compelled to adopt this average until buildings are constructed with large and small gymnasiums, hygiene rooms, swimming pools, and playgrounds adequate for a program in health education of four or five periods a week.

Home Economics

Home economics is a required subject in eight of the fourteen centers in the fifth and sixth years. An additional center requires it in these years but omitted it the semester in which this investigation was made. In five centers home economics is first introduced into the curriculum in the seventh year, in four centers as a required subject and in one center as an elective. In the ninth year three centers only list home economics as a required subject. The cost of proper building facilities and equipment so frequently controls the introduction of home economics into the elementary school that comparisons between school systems as to conviction in the matter of the educational value of home economics should not be made.

Furthermore, it should be recalled that most of the school systems selected particular elementary schools or junior high schools to participate in the investigation. The schools selected may not offer home economics because of lack of building facilities, but other schools in the same system may include home economics in their curriculums. This condition prevails also in the case of other special or handwork courses, gymnasium work in health education, etc. The investigation could not include all of the schools in the large systems, and for the primary purpose of the investigation—namely, to study typical curriculum practices—a general survey was not necessary.

The amount of variation in time allotments approximates in the fifth and sixth years the respective average time allotments. This pronounced range of variation reveals a surprising difference of opinion as to the amount of time which should be allotted to home economics. Home economics and industrial arts have received, in their comparatively recent introduction into the curriculum, a decidedly varied reception from boards of education and school patrons. Traditional practice and prejudice have surrendered slowly in many communities to the so-called practical arts. It has doubtless been beneficial to the evolution of the practical arts as integral parts of the curriculum that many communities have taken a conservative position in introducing new units of instruction. Furthermore, the practical arts have invariably been first introduced into the secondary schools as experimental units of instruction. Until the experiment has been carefully tested in the higher grades of the school system there is apparently a reluctance to incur the expense involved in equipping an elementary school for practical arts work.

It is significant, however, of an increasing faith in the educational and social values of the practical arts that nine of the fourteen centers include this type of instruction in the fifth and sixth years. It is highly significant that all of the centers[1] include practical arts in the seventh year. In nine of the eleven junior high school centers home economics is continued as a required subject in the eighth year; in two centers it is offered as an elective. The building and equipping of new and reorganized schools present opportunities for the adoption of home economics as a part of the curriculum. Where conditions of building are favorable to the introduction of the practical arts, there is an encouraging unanimity of judgment as to their educational value.

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[1] Atlanta reorganized its 7-4 system on the 6-3-3 basis in September, 1923, provision being made for practical arts in all of the junior high schools.

The variation of practice in continuing practical arts as a required subject into the ninth year is evidence again, as in the case of art education, of the persistence of the traditional separation of the seventh and eighth years from the ninth year. The practice is a concession to college-admission requirements, which unfortunately are allowed to disintegrate courses of study in the junior high school.

The introduction of home economics into the fifth and sixth years must, no doubt, be determined, as it has been, by the financial ability of the community to support it and by the physical plant of the elementary school. The investigation reveals a general consensus of opinion in favor of including home economics in the seventh and eighth years, particularly in junior high schools. The fact that three centers include the home economics course as a required subject in the ninth year demonstrates the practicability of doing so and, at the same time, of meeting the demands of college-entrance requirements now made on ninth-year work. The integration of the junior high school program of studies should be promoted by progressively completing in the ninth year those units of instruction of general educational value which are offered in the seventh and eighth years. The 6-3-3 organization distinctly changes the ninth year from the initial year of the high-school program of studies to the final year of the junior high school program of studies.

Industrial Arts

In eight of the fourteen centers industrial arts, usually manual training or woodwork, is required in the fifth year. In nine centers it is required in the sixth year; in four other centers it is introduced as a required subject in the seventh year. When Atlanta opened its junior high schools in September, 1923, industrial arts was introduced as a required subject into the seventh year. Therefore, in over one-half of the centers industrial arts is a required subject in the fifth and sixth years of the elementary school, and in all of the centers, with one exception,[1] industrial arts is required of all pupils in the seventh year. Industrial arts continues as a required subject in the eighth year in all 6-3-3 and 6-6 school systems except St. Louis, which offers it as an elective. Five centers complete a progressively organized junior high school course in industrial arts by continuing the required work into the ninth year.

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[1] Kansas City, by reason of its one-session plan, is temporarily unable to organize its junior high school curriculum to include practical arts as a required subject.

The comments made with regard to the general practice in home economics apply with equal effect to industrial arts.

In the fifth and sixth years the weekly time allotments vary from one hour to three hours. In the seventh and eighth years the weekly time allotments vary from one hour to five hours. This surprising variation has no explanation except the difference in judgment among the centers with regard to the educational value of industrial arts as compared with the other subjects of instruction. Probably in no other subject in the curriculum is there greater difference in the evaluation of educational objectives and results. Industrial arts as a required subject for general educational purposes has come largely as a by-product of the subsidized vocational training so generally adopted since the enactment of the Smith-Hughes Law. The modification of vocational courses for general educational values has not yet developed the type of industrial training which will ultimately be generally accepted. The experimentation must continue until a general shop course, a home mechanics course, an applied science course, or some other type of industrial arts training is evolved which will become generally acceptable as the required unit of instruction. Vocational courses, as is the case in some of the fourteen centers investigated, will remain elective.

The variations in practice shown in Table XIX should occasion no serious alarm. In fact, variation and experimentation should be encouraged so that from wide variation in practice there may ultimately be evolved a solution of the problem of a required industrial arts course and of the problem of a relatively balanced time schedule. Consequently, in the case of industrial arts, as in the case of many other subjects in the curriculum, the present widespread variation in curriculum practice makes it extremely desirable that investigation be continued and carried to the point of curriculum reorganization; the latter must be based on a far more extensive study than has been possible in this investigation. The present report can accomplish little more than reveal the need and point the way.

As was said in the case of home economics, it is significant of a growing faith in the educational value of the practical arts that virtually all of the fourteen centers include the practical arts among the required subjects of the curriculum, particularly in the junior high school years. New school buildings invariably provide for the housing and equipment of practical arts and offer the opportunity to add practical arts to the curriculum.

The failure to continue industrial arts as a required subject into the ninth year can no doubt be explained by the same conditions which result in cleavage between the seventh and eighth years and the ninth year in art education and home economics.

Where building facilities permit, industrial arts should be introduced into the curriculum of the fifth and sixth years to the extent of not less than one clock-hour and not more than three clock-hours a week. The time distribution should be determined by the demands of other subjects on the time schedule and by local reaction to the educational value of industrial arts.

When the junior high school is relieved of accrediting relations with the colleges, industrial arts should become a continuous and progressive course of study throughout the three years of the junior high school. Meanwhile, industrial arts, in some such general type as household mechanics or general shop, should be made a required subject in the seventh and eighth years and continued as at least an elective in the ninth year. The average time allotment in each of the seventh, eighth, and ninth years approximates three clock-hours a week. The examination of a later table will reveal the division of the time allotment generally adopted in the fourteen centers between shopwork and mechanical drawing.

As an alternative of the general shop course several centers give short optional courses in special type shops in the seventh and eighth years and an elective of a particular special shop or of two or more shops in the ninth year and frequently in the eighth year. This is accepted practice but is possible only in large schools because of the prohibitive expense of special shops.

MATHEMATICS

The average weekly time allotment to mathematics is virtually the same for the fifth year as for the sixth year—an average of 200 minutes or five periods of forty minutes each. The average weekly time allotments for the seventh, eighth, and ninth years show gradually increasing allotments for the seventh and eighth years and an increase of almost an hour from the eighth year to the ninth year.

Mathematics, which is exclusively arithmetic in the fifth and sixth years, is naturally a required subject in these years in all of the fourteen centers. Table XIX reveals a higher degree of uniform practice in weekly time allotments in this subject for these years than prevails in other major subjects, namely, English, geography, and social studies, and yet the difference between the highest and the lowest weekly time allotments is two and one-half to three hours.

Mathematics, either arithmetic or general mathematics, is a required subject in the seventh and eighth years. The elective in the ninth year of five centers is actually an option of different courses in mathematics in various curriculums. This means that some type of mathematics is required by all centers in the ninth year. The increase in average weekly time allotment of over half an hour between the sixth and seventh years is accounted for in part by the change from exclusive arithmetic to general mathematics in the junior high school and in part by the fact that the school day is usually lengthened in the junior high school.

The variation in time allotments in the fifth and sixth years is 175 and 155 minutes a week, respectively, or 11.2 per cent and 10.7 per cent, respectively, of the school week. These figures compare favorably with the variation in other major subjects of the curriculum, but they reveal at the same time a confusion of practice in curriculum organization and a difference of judgment with regard to relative values for which it is difficult to account. The explanation may be varying standards of achievement, greater time allotments in the grades immediately below the fifth, more efficiently organized courses of study with the elimination of needless units of teaching, more effective drill on fundamental processes, or superior supervision. Whatever the explanation, the need is apparent to continue investigation in order that scientifically determined standards of needs, achievement, materials, and methods may be made available through a comprehensive program of curriculum readjustment. Until such standards are established by a nation-wide investigation and by committees in each subject field in which all school systems will have implicit confidence, the present confusion of curriculum practice and the apparently needless waste of school time and public funds must be expected to continue.

The changes which are being introduced in the curriculum must be made in accordance with the clearly defined purpose of securing more efficient instruction. The process of enrichment of elementary courses of study with introductory or initial secondary courses of study, that is, the articulation of junior and senior high school courses of study into general units of instruction for the junior high school, should result in a corresponding effort toward more effective articulation of elementary-school and junior high school courses. Valuable time might be saved by both types of articulation for all three units of the 6-3-3 system to the end of increasing the efficiency of the present curriculum in each unit and for the even greater purpose of making possible the introduction of new units of instruction which the shift of recent years from disciplinary to social values in education has rendered so desirable and necessary.

The varied practice in the ninth year of the fourteen centers, shown in the range of time allotments from 200 to 450 minutes a week or a difference of over four hours a week, and the varied practice of a required course or an optional course for the ninth year challenge serious attention. As previously pointed out in connection with other subjects, the persistence of traditional practice in the ninth year invalidates the consistent development of an integrated program of studies for the junior high school. General mathematics has been widely adopted by junior high schools as a required course for the seventh and eighth years. It is, however, abruptly abandoned in the ninth year for an exclusive algebra course largely because of traditional practice and college-entrance requirements. This condition will be remedied, no doubt, in a long period of years, but a consistently administered course of general mathematics in the three years of the junior high school should not be forced to await the slow development that will come with the lapse of time when it can be more rapidly accomplished by a long-needed and inevitable change from a four-year to a three-year college-accrediting standard.

The increase of an average of approximately an hour a week in the ninth year is due, no doubt, to college-entrance requirements in algebra. Apparently no credit can be given for the work in algebra done in the general mathematics course of the eighth year. This is extremely unfortunate since the increase in the time allotments to mathematics and other major subjects in the ninth year results in the elimination from the ninth-year curriculum of the fine and practical arts and of other units of instruction which are introduced into the seventh and eighth years and abruptly abandoned in the ninth year. The lines of cleavage which prevail between the seventh and eighth years and the ninth year, if they are allowed to persist, will result in destroying the unity of the junior high school program of studies. The practice of drawing lines of demarcation between consecutive years of the intermediate unit of the 6-3-3 organization, which is clearly revealed in this investigation, constitutes a serious menace to the evolution and permanence of the junior high school. It is clear that a modification of accrediting relations should be sought between secondary schools and higher institutions.

The average weekly time allotments to arithmetic in the fifth and sixth years is 200 minutes or five forty-minute periods. This allotment conforms to the practice of the majority of the school systems in the country.

The practice of increasing the time allotment of the sixth year by approximately 20 per cent in the seventh and eighth years is evident in Table XIX. Where either a longer school day with directed study periods or a general mathematics course is adopted, a 20 per cent increase of time would seem to be warranted. At least, it has the authorization of average practice in fourteen representative cities.

In the ninth year it may be impossible to avoid another increase of time—an average of almost sixty minutes a week in the fourteen centers—so long as college-admission requirements must be met. It would seem desirable, however, to restrict this practice to college-preparatory classes and to use the extra time in the case of other classes in order to enrich the ninth-year curriculum with the fine and practical arts and other units of instruction which should be continued as required subjects from the eighth year. At a later period of the junior high school movement it may be possible to continue general mathematics into the ninth year and thus by a unit of instruction common to all curriculums meet the present conflicting needs of college-preparatory, commercial, and general or non-college-preparatory groups of ninth-year pupils.

Music

Music is a required subject in all of the fourteen centers in the fifth and sixth years and in all of the centers except one in the seventh and eighth years; in nine of the fourteen centers it continues as a constant into the ninth year. This is strong evidence that music has become a part of the core curriculum of the elementary school and persists as a constant in the program of studies of the junior high school in the seventh and eighth years. Music is continued as a constant into the ninth year in more than twice as many centers as the second of the fine arts group. Art is a required subject in only four of the fourteen centers in the ninth year, while music is a constant in nine. The situation may be indicative of a tendency, which it is to be hoped will continue, to organize progressive courses in the fine arts through the three years of the junior high school.

The cultural and aesthetic values of both of the fine arts have, since the inception of the junior high school, been needed to counteract the general tendency to overemphasize vocational and utilitarian values in the administration of the junior high school program of studies.

While it is probably inevitable that succeeding waves of general interest in particular subjects of the curriculum will characterize educational progress, balance should be sought at all times in the program of studies. It is significant of an effort to preserve balance in the junior high school program of studies that the fourteen centers give as prominent a place to the fine arts as to the practical arts in the administration of the curriculum. The tendency progressively to organize full three-year courses is even greater in the fine arts than in the practical arts. Accordingly, the balance between the fine and the practical arts is being preserved in spite of the widespread stimulation which the practical arts have received in recent years.

The highest weekly time allotment to music is two and one-half times the lowest weekly time allotment in both the fifth and the sixth years. In the junior high school years the highest weekly time allotments are twice the lowest weekly time allotments. The situation is easily explained by those familiar with the supervision of music in the large cities. In distinction from the other subjects of the program of studies, both music and art usually receive attention in the administration of the curriculum in proportion to the type of leadership and the amount of supervisory assistance. An aggressive and progressive supervision of music or art in any system of schools will secure for the fine arts recognition in the time schedule which it is not denied the fine arts deserve but which is far in excess of the time allotment in school systems where conditions do not favor the organization of a large fine arts supervisory staff.

In the junior high schools the practice is well established of departmentalizing the fine arts to the extent of providing specially trained teachers who give their whole time to one junior high school. Generally the fine arts supervisors of the city school system direct the class work. In virtually all of the centers investigated the practice of supervision and of specially trained teachers assigned on full time to one building was found to prevail in both the fine and the practical arts. This type of curriculum administration will ultimately have an important effect in enlarging the traditional and disciplinary values in education by the addition of the aesthetic, vocational, and highly social values of the fine and practical arts.

How to Make a Curriculum,[1] by Franklin Bobbitt, contains much evidence of a tendency to ascertain the social values of all of the subjects of the curriculum. The socialization of the program of studies is a chief characteristic of curriculum-making today. The problem has been recognized; experiments have been undertaken; and progress is being made, as evidenced by the increase in time allotments and in supervisory and specially trained teaching staffs for the fine and practical arts in virtually all of the fourteen centers and by the extensive and significant study in the socialization of the curriculum made by Bobbitt at Los Angeles. There are many other indications of the same general drift from disciplinary to social values in educational administration. In each of the centers confusion consequent to the fundamental shift in point of view was frankly admitted in some one or more of the subjects of the curriculum.

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[1] Franklin Bobbitt, *How to Make a Curriculum*. Boston: Houghton Mifflin Co., 1924.

The problems of readjustment are more than evolutionary; they are almost revolutionary. They warrant the serious attention of any agency which is prepared to contribute to the solution of the many problems of curriculum reorganization so apparent in the varied practices of curriculum administration in the fourteen centers participating in the investigation.

The average time allotment to music in the fifth and sixth years is one and one-half hours a week or approximately 5.5 per cent of the school week. Music is not usually given in daily periods; in only four centers is music given in the daily schedule of classes. The average weekly allotment of ninety minutes suggests three periods a week of thirty minutes each. Administratively, this practice would economically adjust itself to a special music teacher's schedule whose time might be divided among several elementary schools.

The average time allotments in the junior high school years approximate seventy minutes a week. Where special music teachers give their whole time to single junior high schools the distribution of the time is largely determined by the exigencies of the schedule of classes. For example, in the seventh year one center gives three periods a week of 20 minutes each; one gives two periods of 30 minutes each; two give three periods of 30 minutes each; one gives two periods of 40 minutes each; two give one period of 45 minutes; three give one period of 50 minutes; one gives two periods of 50 minutes each; and two centers give one period of 60 minutes. Where sixty-minute periods can be split in a daily schedule of classes, it would seem desirable to divide the total weekly allotment among two or three half-periods of thirty minutes each. The majority of the music teachers in the junior high school centers are favorable to more frequent and shorter music periods. At the same time most of the art teachers favor the longer period because of the time spent in preparation for class work.

The practice of nine centers in making music a constant throughout the three years of the junior high school gives a majority report in favor of a progressively organized and required course in music.

SCIENCE

One-half of the centers include science, that is, nature study, among the required subjects of the fifth year. Two centers introduce science as a required subject in the sixth year. Thus nine centers include science in the elementary curriculum. In one platoon school the science is taught by a special science teacher; in two other school systems the science work is departmentalized with geography.

Science finds a place in the core curriculum of six centers in the seventh year and of seven centers in the eighth year. In the ninth year science is a required subject in three centers and an elective in eight centers. Eleven of the fourteen centers include science in the ninth-year curriculum as a required or elective subject.

Science presents the greatest variation in practice of any major subject of the curriculum. This statement applies to all of the five grades covered by this investigation. There is approximately as wide a variation in the proportional time allotments for science as for any other major subject. Among the subjects which offer large social and practical values to a well-organized curriculum it would appear that science should receive particular recognition from curriculum-makers. Such does not seem to be the case. However, the attempt to bridge the gap in the junior high school between the nature study of the elementary school and the specialized science of the high school is clear evidence not only that curriculum-makers in some centers are aware of the important, if not indispensable, educational value of science in the seventh, eighth, and ninth years but that they are actually creating courses of study adaptable to the junior high school. The writer discovered in practically all of the centers favorable judgment with regard to the introduction of science, that is, natural science, into the core curriculum of the seventh and eighth years and in several cities not at present giving this course a decision to include it in the curriculum when satisfactory courses of study are prepared, suitable textbooks selected, and trained teachers chosen.

Two of the fundamental purposes of the junior high school are stated by Briggs as follows: "To explore by means of material in itself worth while the interests, aptitudes, and capacities of pupils" and "to reveal to them, by material otherwise justifiable, the possibilities in the major fields of learning."[1] It is difficult to understand how many pupils in the junior high school can be guided intelligently in their choice of differentiated curriculums unless the field of science is revealed to them and their aptitudes are determined for the science electives which characterize some of the advanced curriculums. For the specific purposes of the junior high school, therefore, science seems indispensable as an important factor in the core curriculum in the semesters prior to the offering of electives.

There is, however, an even more vital reason for courses in natural science in the seventh and eighth years. The pupil needs to interpret his personal life—for example, he should learn the importance of personal hygiene and right habits of living. He needs to interpret his home environment—for example, food, sanitation, ventilation, etc. He needs to interpret his social environment—for example, water systems, sewage-disposal, lighting, transportation, etc. He needs to interpret the vast significance of science to everyday life and to American industrial life the development of which is controlled in a large degree by scientific discoveries. The boy and girl of the junior high school age are experiencing their first social and vocational consciousness of a world the well-being and progress of which are controlled by science; they observe examples all around them of the wonders of science; they see the benefits which science has brought to social and individual life; they marvel at the scientific discoveries of their own age; they live in the midst of an industrial expansion based on science which surpasses that of any previous period; and it is no wonder that their eager and inquisitive minds hunger and thirst for a knowledge of science to interpret the phenomena surrounding them.

It is encouraging, therefore, to note the experimentation which is being carried on in adapting science courses to seventh- and eighth-year pupils. It is indicative of a general purpose to add science to the core curriculum of the junior high school that other centers have reached the decision to introduce science when conditions on which they are now working are more favorable. General science is a development of the past decade. It has largely replaced the first-year high-school courses in biology. It has naturally been introduced first into the ninth year where the experimentation has been largely carried on. It is beginning to find its way into the curriculums of the seventh and eighth years. It will and should in time become a required major subject in the junior high school program of studies throughout the three years. School systems, at least the fourteen co-operating centers of this investigation, are convinced of the educational value of science in the junior high school program of studies. They will welcome every agency which will promote the more rapid evolution of practicable courses of study and materials of instruction.

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[1] Thomas H. Briggs, *The Junior High School*, p. 26. Boston: Houghton Mifflin Co., 1920.

The time allotments to nature study in the fifth year in the seven centers which report it as a distinct course of study average approximately two periods a week of thirty-five minutes each. Where conditions are favorable with respect to equipment, room, and properly trained teachers nature study is worthy of a place in the fifth and sixth years.

As rapidly as conditions warrant, science should be made a required subject in the seventh, eighth, and ninth years. In the administrative operation of the schedule of classes geography is a gradually decreasing unit, and science in a corresponding degree becomes a gradually increasing unit. The two subjects can, therefore, be combined as one administrative unit in the schedule of classes. Table XIX shows an average weekly time allotment to science of 132, 178, and 195 minutes in the seventh, eighth, and ninth years, respectively, that is, an average of approximately two, three, and three periods a week, respectively, of sixty minutes each. When college-admission requirements are more reasonably adjusted to the three years of the senior high school, science should become a required subject in the ninth year. Meanwhile, it may be necessary to make general science elective in college-preparatory curriculums, but it should be made a required subject in non-college-preparatory curriculums.

The distinctions of nature study, elementary science, general science, etc., are inherited from the former practice of specialized courses in science. The simple and all-inclusive designation of natural science for all years at least of the elementary and junior high schools is adequate to define this subject of the curriculum. A contribution of incalculable value to this modern age of scientific life and achievement will be made by the junior high school if it succeeds in establishing science as one of the required constants of the program of studies in secondary education.

SOCIAL STUDIES

Twelve centers require social studies in the fifth year; in one center the subject is not reported as part of the required curriculum; one center reports that the work takes the form of organized social activities. Approximately the same situation prevails in the sixth year with the exception that one center begins required social studies in this year. The average weekly time allotment is approximately two hours in the fifth year and two and one-half hours in the sixth year.

In the seventh and eighth years all of the fourteen centers require social studies. The average weekly time allotment is about four hours, approximately twice the average weekly time allotments in the fifth and sixth years. This large increase in time allotments to social studies in the junior high school is significant of a general appreciation of the outstanding importance of social studies to the intermediate unit of the 6-3-3 organization. The following is quoted from the *School Review:* "The main objectives of the social science group are closely akin to and almost inclusive of the principal objectives of the junior high school and of the basic reasons for the existence of this division of the school system as a distinctive institution."[1] In view of the intrinsic value of the social studies to the junior high school, it is easy to understand why seven of the junior high school centers continue the subject as a constant throughout the three years, and it is difficult to comprehend, even in view of uncompromising college-admission requirements, why six junior high school centers offer social studies as an elective in the ninth year.

In the fifth and sixth years, the time allotments vary from one weekly period of fifty minutes to a daily period of fifty minutes or from fifty minutes to 250 minutes a week. However, the weekly time allotment is 125 minutes or more in the fifth year of six centers and in the sixth year of eight centers. It is encouraging to note even this amount of agreement in the problem of adapting social studies materials to the elementary grades and in the problem of adjusting the time schedule to the demands of units of instruction which in recent years have received new importance. When the time allotments to a major subject in the elementary school in large school systems vary from 3 per cent to 15 per cent of the school week, there is revealed, beyond question, a wide difference of opinion with regard to relative values.

The variation in weekly time allotments in the seventh and eighth years amounts to two hours; that is, the minimum weekly time allotment is three hours and the maximum five hours; the average is four hours. The practice proves conclusively that social studies have been generally adopted as a required major subject in the junior high school program of studies for the seventh and eighth years. The same discrepancy in continuing the required major subject into the ninth year is apparent in the case of the social studies as in the case of other subjects of the curriculum. There are, however, seven junior high school centers which include social studies among the constants of the ninth year. The situation reveals a tendency to reduce to a minimum the inhibitory influence of college-entrance requirements on the ninth-year core curriculum.

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[1] Seymour I. Stone, "The Social Sciences in the Junior High School," *School Review*, XXX (December, 1922), 769.

The common need of all junior high school pupils, whether college preparatory or non-college-preparatory, for a progressively organized course of study in social science does not permit of dispute. The fact that seven centers organize the course in social studies on a progressive basis throughout the three years is indisputable evidence that the practice will become general in the further development of the junior high school program of studies.

The experiment of adapting upper-grade social studies materials to the fifth and sixth years is extensively carried forward by practically all of the fourteen centers. The average weekly time allotment is two hours in the fifth year and two and one-half hours in the sixth year. The classes could be arranged on this average basis by scheduling three periods a week of forty minutes each in the fifth year and four periods a week of forty minutes each in the sixth year. Daily classes could be provided for by scheduling periods of twenty-five minutes in the fifth year and periods of thirty minutes in the sixth year.

The average weekly time allotment in the seventh and eighth years is four hours. In four of the centers which continue social studies as a constant in the ninth year the weekly time allotments are practically the same in the ninth year as in the seventh and eighth years. It would seem desirable in all school systems to require at least three hours or three periods a week in social studies in the ninth year rather than to make the subject an elective, thereby depriving some pupils of valuable units in a progressive course in social studies.

CHAPTER V

ELECTIVE COURSES

The preceding chapter dealt with required subjects. The present chapter will deal with the electives. There are certain subjects which must be discussed both as constants and as electives, namely, art, English, home economics, industrial arts, mathematics, music, science, and social studies.[1] On the other hand, three subject fields, namely, commercial education, Latin, and modern languages, appear only in the present chapter because they are administered solely as elective courses. There are two exceptions to this statement which will be pointed out in later paragraphs; these exceptions arise from the fact that business practice or junior business training and a general language course are administered as constants in the curriculum by one center each. It is to be noted that this exceptional practice constitutes a tendency to enlarge the scope of the core curriculum in the interest of broader opportunities for the exploration of pupils' aptitudes and interests in the junior high school.

Tables XXI and XXII are included in the present chapter. Table XXI gives the allocation of subject electives according to grades, and Table XXII gives the number of minutes a week allotted to the various elective courses in each subject field. Table XXI indicates very clearly the wide divergence of practice with respect to the grade in which the electives are first offered and also with respect to the number of years of the junior high school in which the electives are continuously offered. Table XXII confirms the impression derived from Table XXI and emphasizes two important kinds of variation, namely, variations in the types of elective courses offered and variations in the time allotments.

All of the facts reported in this chapter make it clear that the school of today is departing from the traditional practices of the earlier elementary school and high school. Experiments are evidently being tried on a wide scale for the purpose of determining the grade in which a given course should be administered and for the purpose of trying out the administrative device of offering electives to pupils of junior high

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[1] Since the few instances in which geography and health are offered as electives are in reality concessions to the impending reorganization of the social science course or to temporarily inadequate health facilities, these two subjects are not discussed in this chapter.

TABLE XXI

Allocation of Subject Electives According to Grades

	Art	Commercial Education	English	Home Economics	Industrial Arts	Latin	Mathematics	Modern Languages	Music	Science	Social Studies
Atlanta	....	9	....	9	....	9	....	....	5, 6, 7	....	....
Berkeley	9	7, 8, 9	....	9	7, 8, 9	9	9	7, 8, 9	5, 6, 7, 8, 9	7	9
Birmingham	7, 9	....	....	9	9	9	....	9	5, 6, 7, 9	....	9
Cleveland	9	7, 8, 9	....	7, 8, 9	7, 8, 9	7, 8, 9	....	7, 8, 9	7, 8, 9	9	9
Decatur	9	9	....	9	9	9	9	9	5, 6, 7, 8, 9	9	9
Denver	8, 9	7, 8, 9	....	8, 9	7, 8, 9	7, 8, 9	....	7, 8, 9	5, 6, 7, 8, 9	9	9
Detroit	....	8, 9	....	8, 9	8, 9	8, 9	....	8, 9	....	....	....
Kansas City	7, 9	9	....	7, 9	7, 9	7, 9	9	7, 9	5, 6, 7, 9	9	5, 6, 9
Los Angeles	8, 9	7, 8, 9	9	9	7, 8, 9	8, 9	....	8, 9	5, 6, 7, 8, 9	9	9
Okmulgee	7, 8, 9	7, 8, 9	7, 8, 9	7, 8	7, 8, 9	8, 9	9	....	7, 8, 9	7, 8, 9	6, 9
Pittsburgh	9	8, 9	....	8, 9	8, 9	8, 9	....	8, 9	7, 8, 9	9	9
Rochester	8, 9	8, 9	....	7, 8, 9	8, 9	8, 9	....	8, 9	7, 8, 9	....	....
St. Louis	8, 9	8, 9	....	8, 9	8, 9	9	9	9	5, 6, 7, 8	9	....
Somerville	....	7, 8, 9	....	7, 8, 9	7, 9	7, 8, 9	....	7, 8, 9	7, 8, 9	....	9

TABLE XXII

NUMBER OF MINUTES A WEEK ALLOTTED TO ELECTIVES*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Art:†														
Grade 7	......	......	60	......	......	......	......	125	......	275‡	......	......	......	......
Grade 8	X§	......	X	......	......	100 250	......	X	210	275‡	......	120	250	......
Grade 9	......	200	90 135	225 450	100	100 250	......	250	200	275	220	180	250	......
Commercial education:														
Grade 7:														
Business arithmetic	......	......	......	......	......	50‖	......	......	......	......	......	......	......	180
Business forms	......	......	......	......	......	50‖	......	......	......	......	......	......	......	......
Business writing (penmanship)	......	......	......	......	......	50‖	......	......	210‖	......	......	......	......	......
Stenography (exposure course)	......	......	......	......	......	......	......	......	210‖	......	......	......	......	......
Typewriting	......	200	......	225‖	......	260‖	......	......	210‖	275‡	......	......	......	60
Grade 8:														
Bookkeeping	X	......	X	......	......	......	......	X	210‖	......	......	......	260‖	......
Business arithmetic	X	......	X	......	......	260‖	......	X	......	......	......	150	......	......
Business practice	X	......	X	......	......	......	300	X	......	......	220	......	......	180

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* In some cases two electives with widely varying time allotments are offered; in these cases two figures are given. The questionnaires provided for the distribution of the time allotments to the divisions of the subjects. Frequently a period is divided between two or more electives. Consequently a portion of a given period was allotted to each of several electives. In many cases, therefore, the number of minutes given in the table shows no fixed relation to the length of the standard recitation period. The courses are full-year courses unless otherwise indicated.

† The types of elective courses in art were not ordinarily indicated in the reports.

‡ Quarter-year course.

§ X means that the school system is organized on the 7-4 plan and does not include an eighth grade.

‖ Half-year course.

TABLE XXII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Commercial education: Grade 8—*Continued*														
Business practice (required)*	X		X					X			110			
Business writing (penmanship)	X		X					X	210			60		
Commercial geography	X		X					X				240†		
Elements of business	X		X					X		275‡				
Stenography (exposure course)	X		X					X	210					
Typewriting	X	200	X	225		260†		X	210		220	210†	260†	60
Grade 9:														
Bookkeeping		200		225		260†	240	250	210		220	300	260	300
Business writing (penmanship)	100								210			60		60
Commercial arithmetic	200				250				210			180		
Commercial geography	200													
First lessons in business								250						
Office practice													260	
Penmanship and spelling										275				
Stenography		200							210		220		260	
Typewriting		200				260†	150	250	210		220	180	260	120
English:														
Grade 7:														
Journalism (constructive English)										275‡				
Public speaking and expression										275‡				
Grade 8:														
Public speaking and expression	X		X					X		275‡				

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* At the Latimer Junior High School, Pittsburgh, all pupils not electing commercial subjects are required to devote two periods a week during the eighth year to business practice.

† Half-year course. ‡ Quarter-year course.

TABLE XXII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
English—*Continued*														
Grade 9:														
Journalism (constructive English)	......	......	......	......	......	......	......	......	84	......	......	......	......	......
Library practice	......	......	......	......	......	......	......	......	252	......	......	......	......	......
Oral English	......	......	......	......	......	......	......	......	84	......	......	......	......	......
Public speaking and expression	......	......	......	......	......	......	......	......	......	275	......	......	......	......
Home economics:														
Grade 7:														
Clothing	......	......	......	450*	......	......	......	......	......	275*	......	270† 360†	......	180
Foods	......	......	......	450*	......	......	......	125 200	......	275*	......	......	......	120
Home and family	......	......	......	......	......	......	......	50‡	......	......	......	......	......	60
Textiles	......	......	......	......	......	......	......	......	......	......	......	120†	......	......
Grade 8:														
Clothing	X	......	X	450*	......	260†	180	X	......	275†	80 320	270†	156‡	180
Foods	X	......	X	450*	......	260†	90	X	......	275*	80 320	......	104‡	120
Home and family	X	......	X	......	......	......	90	X	......	275*	30 120	......	......	60
Millinery	X	......	X	......	......	......	......	X	......	......	80	90†	......	......
Textiles	X	......	X	......	......	......	......	X	......	......	......	120†	......	......
Grade 9:														
Clothing	240§	200	135	180†	250‖	260†	180	200	200**	......	40 300	270† 360†	156†	150 390
Foods	......	200	......	270†	250	260†	90	200†	200††	......	40 300	......	104	120 180
Home and family	240‡‡	......	......	......	250§§	......	90	50	200††	......	40 150	......	......	30 90
Millinery	......	......	......	......	......	......	......	......	......	......	50 100	90† 180†	......	......
Textiles	......	......	......	......	......	......	......	......	......	......	......	120†	......	......

* Quarter-year course.
† Half-year course.
‡ A half-year course is offered in addition to the full-year course.
§ Thirty-two week course.
‖ Thirty-week course.
** Sixteen-week course.
†† Twelve-week course.
‡‡ Four-week course.
§§ Six-week course.

TABLE XXII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Industrial arts:*														
Grade 7:														
Cafeteria	......	......	......	......	......	......	......	......	210	......	......	......	......	......
General shop	......	......	......	......	......	......	......	250	......	......	......	......	......	......
Mechanical drawing	......	......	......	......	......	......	......	......	210†	275‡	......	......	......	......
Metal-work (sheet metal)	......	......	......	......	......	......	......	......	......	275‡	......	......	......	60 180
Printing	......	200	......	......	......	250	......	......	210	......	......	......	......	......
Reed work	......	......	......	......	......	......	......	......	210	......	......	......	......	......
Woodwork	......	......	......	360†	......	......	......	......	210	275‡	......	......	......	60 180
Grade 8:														
Art needle-work	X	......	X	......	......	......	......	X	210	......	......	......	......	......
Auto mechanics	X	......	X	......	......	......	360‡	X	......	......	......	......	......	......
Automobile repairing	X	......	X	......	......	......	......	X	......	......	......	900	......	......
Bookbinding	X	......	X	360†	......	......	......	X	......	......	......	......	......	......
Cafeteria	X	......	X	......	......	......	......	X	210	......	......	......	......	......
Commercial art	X	......	X	......	......	......	......	X	......	......	......	900	......	......
Drafting	X	......	X	......	......	......	......	X	......	......	......	900	......	......
Electricity	X	200	X	360†	......	......	360‡	X	210	275‡	120‡ 240‡	900	......	......
Forge	X	......	X	......	......	......	......	X	......	275†	......	......	......	......
Home mechanics	X	......	X	......	......	260§	......	X	210	......	......	......	......	......
Machine shop	X	......	X	......	......	......	......	X	......	......	120‡ 240‡	900	......	......
Mechanical drawing	X	......	X	......	......	......	......	X	210	275‡	180	90 180	......	......
Metal-work (sheet metal)	X	......	X	360†	......	......	......	X	210	......	120‡ 240‡	360 900	......	......
Printing	X	200	X	360†	......	250	360‡	X	210	275‡	120‡ 240‡	360 900	......	......

* Atlanta reorganized its 7-4 system on the 6-3-3 basis in September, 1923, provision being made for practical arts in all of the junior high schools.

† Half-year course.
‡ Quarter-year course.
§ Thirty-four week course.

TABLE XXII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Industrial arts: Grade 8—*Cont.*														
Reed work	X		X					X	210					
Wood finishing and sign painting	X		X					X			120* 240*			
Wood-turning	X		X			250†		X						
Woodwork	X		X					X	210	275‡	120* 240*		208	
Grade 9:														
Art needle-work									210					
Automobile repairing												900		
Cabinet-making										575		360 900		
Cafeteria									210					
Commercial art												900		
Drafting			900									900		
Electrical theory and shop practice										885				
Electricity									210	1,160	120* 240*	900		
Forge					200‡									
Home mechanics						260			210					
Machine shop			900								120* 240*	900		
Mechanical drawing			225	270	250‡	250†		250	210	575	180	180		360
Metal-work (sheet metal)		200							210		120* 240*		260‡	60 180
Pattern-making							360					360 900		
Printing		200	900			250			210	275	120* 240*			

* Quarter-year course. † Four-week course. ‡ Half-year course.

TABLE XXII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Industrial arts: Grade 9—*Cont.*														
Printing science	......	......	......	......	......	......	......	......	......	275	......	......	......	......
Reed work	......	......	......	......	......	......	......	......	210	......	......	......	......	......
Typography	......	......	......	......	......	......	......	......	......	685	......	......	......	......
Wood finishing and sign painting	......	......	......	......	......	......	......	......	......	......	120* 240*	......	......	......
Wood-turning	......	......	......	......	......	250†	......	......	......	......	......	......	......	......
Woodwork	......	200	225	450	300‡	250§	......	250	210	......	120* 240*	......	260‡	60 180
Latin:														
Grade 7	......	......	......	225‡	......	250‡	......	250	......	......	......	......	......	240
Grade 8	X	......	X	225	......	250	300	X	275	275‡	250	150	......	240
Grade 9	200	200	225	225	250	250	300	250	275	275	250	300	260	300
Mathematics:														
Grade 9:														
Algebra	......	200	......	......	250	......	......	250	......	275	......	......	260	......
General mathematics	......	......	......	......	......	......	......	......	......	275	......	......	260	......
Modern languages:														
French:														
Grade 7	......	200	......	225‡	......	250	......	......	......	......	......	......	......	240
Grade 8	X	200	X	225	......	250	275	X	200	......	220 275	150	......	240
Grade 9	||	200	225	225	250	250	275	250	200	**	275	300	260	300
Spanish:														
Grade 7	......	200	......	225‡	......	250‡	......	225	......	......	......	......	......	240
Grade 8	X	200	X	225	......	250	......	X	200	......	......	......	......	240
Grade 9	......	200	225	225	......	250	......	225	200	**	......	......	260	300

* Quarter-year course. † Eight-week course. ‡ Half-year course. § Thirty-four week course.

|| Atlanta offers an elective in French in the second year of the high school.

** Okmulgee reports as follows: "Modern languages are begun in the tenth year; however, a few ninth-grade students are permitted to elect a modern language if they show sufficient interest and ability. We would recommend that modern languages be begun in the eighth grade as finding and broadening courses and that regular courses be begun in the ninth grade."

TABLE XXII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Music:														
Grade 5:														
Band	.....	.....	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chorus	.....	.....	.....	.....	.....	30	.....	.....	.....	.....	.....	.....	.....	.....
Instrumental	60	20	120	.....	30*	.....	.....	60	.....	.....	.....	.....	45	.....
Music appreciation	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	.....
Orchestra	.....	60	30	.....	.....	30	.....	60	60 90	.....	.....	.....	45	.....
Grade 6:														
Band	.....	.....	75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chorus	.....	.....	45	.....	.....	30	.....	.....	.....	.....	.....	.....	.....	.....
Instrumental	60	20	.....	.....	30*	.....	.....	60	.....	.....	.....	.....	45	.....
Music appreciation	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	.....
Orchestra	.....	60	75	.....	.....	30	.....	60	60 90	.....	.....	.....	45	.....
Grade 7:														
Band	.....	80	30	.....	.....	.....	.....	.....	.....	.....	.....	120	.....	.....
Boys' and girls' glee clubs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	.....	.....	.....
General course	.....	.....	.....	.....	.....	.....	.....	75	.....	.....	.....	.....	.....	.....
Instrumental	60	20	120	.....	.....	.....	.....	.....	.....	55 275	50	180	45	.....
Music appreciation	.....	.....	.....	.....	.....	.....	.....	50	.....	275†	.....	.....	45	.....
Orchestra	.....	80	30	90	50	100	.....	125	120	55 275	250	120	45	60
Grade 8:														
Band	X	80	X	.....	.....	.....	.....	X	.....	.....	.....	120	.....	.....
Boys' and girls' glee clubs	X	.....	X	.....	50	.....	.....	X	.....	.....	50	.....	.....	.....
Chorus	X	.....	X	.....	.....	.....	.....	X	.....	.....	250	.....	.....	.....
Instrumental	X	20	X	.....	.....	.....	.....	X	.....	55 275	50	.....	45	.....
Music appreciation	X	.....	X	.....	.....	.....	.....	X	.....	275†	.....	.....	45	.....
Orchestra	X	80	X	90	50	100 156	.....	X	120	55 275	250	120	45	60

* Thirty-week course. † Quarter-year course.

TABLE XXII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Music—*Continued*														
Grade 9:														
Band		80	30									120		
Boys' and girls' glee clubs					50	50					50			
Chorus			120			75					50			
General course								200	80					
Harmony		80	135								200			
Instrumental		20	90								50			
Instrumental, specialized technique, and harmony										275				
Music appreciation			90					50						
Orchestra		80	30	90	50	156		125	120		250	120		60
Specialized technique		20	60											
Voice interpretation			135							55 275				
Science:														
Grade 7:														
Elementary natural science										275*				
General science		200												
Grade 8:														
Elementary physical science	X		X					X		275†				
Grade 9:														
Botany													260	
General biology					250									
General science				225		250		250	200	385	240		260	
Physiology													260	
Social studies:														
Grade 5:														
Citizenship								45‡						
History								75†						

* Quarter-year course. † Half-year course. ‡ Thirty-week course.

TABLE XXII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Social studies—*Continued*														
Grade 6:														
Citizenship								45*						
Civics										55†				
History								60‡						
Grade 9:														
Ancient history and Greek history						250†			210					180
Citizenship								250						
Community civics			225		250†									
Current events											55†			
Current world history										250				
Economic civics					250§						165†			
European history		200†			250									
International relations				225†										
Political civics									210					
Roman history						250†								
Vocational civics					250‖						165†			

* Thirty-week course.
† Half-year course.
‡ Thirty-one week course.
§ Thirteen-week course.
‖ Six-week course.

school age. Such experimentation is justified by the fact that there are no accepted standards. Modifications of the curriculum must therefore be made on the basis of accumulated experience.

Electives may be offered for one or both of two perfectly defensible purposes. One purpose is to increase the opportunities of pupils with high intelligence quotients who are prepared to carry more work than is provided by the core curriculum and who prove this by passing achievement tests from time to time. For such bright pupils elective courses as early as the seventh year may be warranted.

A second purpose served by electives is to provide for early specialization. Pupils in the junior high school whose aptitudes and interests have been demonstrated, through previously required exploratory courses, to be in definitely determined directions, can, through elective courses, begin to settle down to continuous work of the type which they will follow through the senior high school. If the main purpose of electives is to furnish opportunities for specialization, they should not be offered until the eighth or ninth year, after the preliminary period of exploration provided in the courses of the seventh year.

The different practices shown to exist in the allocation of electives may be explained by a condition of confusion and a difference of opinion as to the primary purposes of the junior high school. So far as electives are offered because of this uncertainty, they represent a purely temporary administrative device.

Certain comments of value to the general reader will be made with reference to Table XXII, which reports the facts regarding elective courses. These will be followed by comments on details which probably will be of interest only to special teachers and supervisors.

GENERAL DISCUSSION OF TABLE XXII

Art and music.—Short courses in music and art are offered as club electives through the three years of the junior high school. This practice makes the electives part of the social activities program and serves both to explore aptitudes on the part of the pupils for the fine arts and to provide additional art and music courses for the pupils who have pronounced interests in these subjects. The virtue of the practice is that it may be administered without serious sacrifice to the subjects of the core curriculum.

In a few centers there is clearly a tendency to offer fine arts electives to such an extent as to make art and music major subjects. This practice will in time develop a fine arts curriculum parallel to the foreign language curriculum, the commercial curriculum, the industrial arts curriculum, and the home economics curriculum. If vocational opportunities for pupils trained in art and music develop to a sufficient extent to offer a livelihood to specialists in these fields, then this tendency is fully warranted. Certainly the tendency is clearly an application of the principle of the equalization of educational opportunities. The investigation revealed the existence in some quarters of the opinion that vocational opportunities exist in the fine arts and that the development of a fine arts curriculum should, as a consequence, be accelerated.

Commercial education.—An examination of the commercial electives shown in Table XXII leaves on one's mind the vivid impression that there is a startling array of commercial courses offered in all three years of the junior high school. The wide range of commercial electives is evidence of the difficult problem of adapting courses in this field to junior high school pupils. Many of the courses now offered in the seventh, eighth, and ninth years are senior high school courses which have been modified only slightly. Clearly the courses which may most effectively initiate commercial education have not been generally determined. In the seventh and eighth years typewriting predominates as the commercial elective. Yet it may be seriously questioned whether typewriting is the best means of initiating commercial education, though no question will arise as to its practicability in the seventh and eighth years. Business practice, business forms, and junior business training are offered as electives in a few centers. Such courses indicate a serious effort to develop initial commercial courses more than does a course in typewriting. It will be noted that Pittsburgh requires business practice for two periods a week during the eighth year as a part of the core curriculum. Thus an exploratory course of worth-while materials may be developed which will assure a general knowledge of common business practice to all pupils and which will help in the selection of those pupils who have special aptitudes for commercial work. By such means it may be possible to eliminate the too frequent and vicious practice on the part of pupils of choosing the commercial curriculum because they do not want to follow the other curriculums which are offered.

Table XXII clearly indicates that commercial education has been widely adopted as a part of the junior high school program of studies. As previously noted, there is considerable uncertainty as to the type of general course which serves best to initiate the commercial curriculum in the grades immediately preceding the ninth year. Bookkeeping and typewriting prevail very largely as the commercial courses in the ninth year. It may be questioned whether this practice has been determined by custom or whether these two courses have been deliberately adopted as the most desirable commercial courses to succeed the first general course of junior business training or business practice.

The problem of organizing commercial courses is a problem of deciding between two possible policies. Specialized commercial courses in the high school are in some cases adapted to the junior high school. In other cases the effort is made to develop new general courses better suited to younger pupils and more consistent with the fundamental aims of the junior high school. The former procedure is the general practice for the obvious reason that there is a lack of initial commercial courses, while the latter is a tendency slowly revealing itself in the administration of the commercial curriculum.

English.—The significant fact in connection with the English electives is that there are any at all. Such electives are so limited that general comment is unwarranted.

Home economics and industrial arts.—Home economics and industrial arts are grouped together under the designation of practical arts for the purpose of the general discussion of Table XXII. In the latter part of this chapter each is treated separately in greater detail. The evidence is plain in this report that the practical arts have been incorporated into the junior high school program of studies as both required and elective courses.

The required courses in this field serve the double purpose of adding the long-needed practical elements to the core curriculum and of providing exploratory opportunities for determining the educational and vocational choices of two groups of junior high school pupils. The first group is made up of those pupils who will continue their education in the senior high school. The second group is made up of those pupils who are going to leave school because they must make their first vocational choices and enter upon industrial careers during the junior high school period.

The elective courses in the practical arts provide both more complete training than is furnished by the required courses for the group of pupils who will continue their vocational training in the senior high school and full vocational training for the group of pupils who must specialize in occupational courses during the junior high school period prior to their placement in industry.

The elective courses in home economics and industrial arts offer to the pupils who are not going to pursue related courses in the senior high school opportunity to get training in a certain kind of skill which is very useful and must be taken in these lower grades if taken at all. The specialized non-industrial curriculums which these pupils take up in the senior high school do not permit of practical courses in the later years.

Latin.—Latin has been introduced into the junior high school in imitation of the universal practice of making Latin an elective in secondary education. All fourteen centers include Latin among the ninth-year electives. Table XXII shows that the experiment of offering Latin before the ninth year is being tried in over half of the fourteen school systems. Introductory and orienting courses are to be found in the eighth year and to a limited degree in the seventh year.

In thus introducing Latin at an earlier period than was formerly the custom in American schools, recent practice follows the example of Europe. Those pupils in the European schools who are going to take higher courses universally begin Latin in the years that correspond to the American elementary grades.

The early introduction of Latin courses serves two distinct purposes. It gives those who are going to go on in the subject a start in the lower grades and thus contributes to proficiency in the subject, and it gives all who think that they want Latin an opportunity to try themselves out. Pupils who find that they have no aptitude for the subject can drop out without serious loss of time and without the interference with their senior high school curriculums which often results when pupils make a bad start in Latin in the later years.

Mathematics.—Electives in mathematics are in the nature of optional courses. Some course in mathematics is required in all centers.

Modern languages.—No center of the fourteen co-operating in the investigation includes German among the modern language electives. French clearly maintains here the same rank that it holds in general as an elective in secondary education. Spanish shows large gains in popularity, probably on account of the disappearance of German. Table XXII does not seem to indicate that Spanish is administered today in response to regional demands, as it was most frequently prior to the world-war. It may be that Spanish is now introduced in deference to the former practice of offering two modern languages. If that is the reason for its introduction, there is little justification for the present practice.

The junior high school program of studies is overweighted with foreign language offerings when three languages—Latin, French, and Spanish—are given simultaneously. It would seem preferable to defer one modern language to the senior high school. The junior high school would then be free to stress other electives of greater relative value to early adolescent pupils—for example, practical arts, fine arts, science, or social studies.

As in the case of Latin, an experiment in developing an introductory and orienting course is being conducted in over half of the fourteen school systems. Special attention is called to the experiment being made at Detroit with a general language course. An outline of the plan is given in connection with the detailed discussion later in the chapter.

Science.—The course in general science as developed in the past ten years is generally adopted in the ninth year of the junior high school. It is administered as a constant in three centers and as an elective in eight. Since the accrediting demands of the colleges imposed on the ninth year prevent in some cases the administration of the general science course as a required subject, the alternative is adopted of offering it as an elective.

In the preceding chapter it was noted that science has been incorporated into the core curriculum of six centers in the seventh year and of seven centers in the eighth year. The tendency, therefore, to make science a constant in the general curriculum is established to this extent. The next logical step is the continuation of the science constant into the ninth year. This consistent organization of a progressive series of science courses through the seventh, eighth, and ninth years is checked, not by a question as to its educational value but by the unfortunate persistence of traditional practice in college admission. Here we see administrative necessity superseding educational objectives in influence. The persistence of the traditional line of demarcation between the eighth and ninth years has no justification, especially when these years are consecutive in the same administrative unit of the public school system.

One of the most significant, and at the same time most threatening, revelations of this investigation is that which is here under discussion. The program of studies in the junior high school is not unified. It suffers a marked breach at the end of the eighth year. In no subject of the curriculum is this more evident than in science. A clearly defined tendency to incorporate science into the core curriculum is revealed, but this tendency is largely checked by conditions which, even if they were justified by an 8-4 type of organization, should be modified as a part of the general acceptance of the 6-3-3 type of school administration.

Social studies.—The administration of the social studies follows very clearly the present tendencies in both elementary and secondary education to adopt a general social science unit of instruction. Many transitional stages of compromise are revealed between the general social science course and the former isolated courses in history, civics, and geography. This evolutionary development is clearly shown in the types of elective social studies offered, particularly in the ninth year.

The tendency to discard ancient history, Roman history, and European history in the ninth year is shown by the fact that only a limited number of centers continue these electives in the last year of the junior high school. When the almost universal practice of two decades ago of offering ancient history in the first year of the high school is recalled, the present trend toward a social science course of study indicates a clear change in practice.

On social studies falls most heavily the burden of the socialization of the curriculum. Social studies must accordingly be administered in the junior high school and undoubtedly in the senior high school also as required units of instruction rather than be retained as elective courses.

The investigation indicates plainly the types of courses which are today most generally administered in the social studies. Attention is directed to the detailed comments on Table XXII in which the progress is traced from the earlier isolated courses in history, civics, etc., through the present co-ordinate social studies courses, to the slow development of a composite social science course.

DETAILED DISCUSSION OF TABLE XXII

In this chapter, as in chapter iv, a detailed discussion of all of the subjects is given. The teachers and supervisors in each field will in this part of the report find detailed information regarding their subjects. It should be noted that the following comments apply to elective courses, while the corresponding discussion in chapter iv referred to required courses or constants.

ART

Three centers offer electives in art in the seventh year. One of the three centers, Okmulgee, has a finding and broadening course of nine weeks in accordance with its general practice of offering try-out courses in all subjects. Five cities offer art electives in the eighth year. All are for a period of a year except the try-out course at Okmulgee. These five centers continue the art electives into the ninth year.

Full-year electives are offered for the first time in the ninth year by four cities. Electives in art, therefore, are offered by eleven of the fourteen centers and are introduced into the curriculum in the eighth year by four centers and into the curriculum of the ninth year by four centers.

A comparison of Tables XIX and XXII shows that Denver, Los Angeles, and Rochester include in their junior high school curriculums both required and elective courses in art in the eighth and ninth years and that St. Louis offers both in the eighth year.

That the art electives are recognized as equivalent to other electives of the ninth year is evidenced by the fact that seven of the eleven centers require daily periods and one center four periods a week. In these seven centers the time allotments vary from 200 to 450 minutes a week or from 40 to 90 minutes a day. An examination of the electives in music shows that seven centers offer music electives which, if taken in a group, would aggregate daily periods of elective music. The appearance of fine arts electives to the extent of five periods a week indicates that there is being introduced into the junior high school a fine arts curriculum among the other differentiated curriculums of the ninth year. The junior high school, therefore, is making progress in its effort to equalize educational opportunities in providing for the varying needs and aptitudes of its pupils. Table XXII also reveals tendencies, which have persisted over longer periods of experimentation than in the case of the fine arts, to initiate an academic or foreign language curriculum and commercial, technical, and vocational curriculums.

The experiment of extending electives by club organizations in all subjects is practically universal. Clubs are a part of the social activities program of the junior high school movement. A social activities program in some stage of development is characteristic of all of the junior high school systems. The club electives in art offered by the junior high schools participating in this investigation include such suggestive extensions of art education as are indicated in the following list of clubs: art craft clubs—for example, wood, clay, textiles, sheet metal, oil, parchment, enamel, etc.; cartoon and poster clubs; interior decoration clubs—for example, basketry, pottery, lamp shades, stenciling, furniture, and weaving; costume-design clubs; bead-work, scrap-book, block-printing, and art-appreciation clubs.

Art deserves recognition as a required subject for all pupils on account of its aesthetic and social values and as an elective for pupils with aptitudes for art on account of the opportunity which it provides to specialize in art training. The junior high school cannot do less than offer a fine arts curriculum if the principle of individual differences which it accepts in theory is to function in practice. Art electives should receive an allotment of time proportional to the time allotted to the elective subjects in other differentiated curriculums, that is, four to five periods daily through the elective period of the junior high school, whether this is the eighth and ninth years or half of the eighth year and all of the ninth year or even part of the seventh year and all of the eighth and ninth years.

COMMERCIAL EDUCATION

Commercial education electives are offered by thirteen centers in one, two, or three years of the junior high school. Berkeley, Cleveland, Denver, Los Angeles, Okmulgee, and Somerville include commercial electives in the three years of the junior high school. Detroit, Pittsburgh, Rochester, and St. Louis offer commercial electives in both the eighth and the ninth years. Atlanta, Decatur, and Kansas City offer electives in only the ninth year. It will be noted that two of the centers giving only ninth-year electives are 7-4 organizations. In the case of the seventh-year electives, most of the courses are restricted to a half-year or less, that is, to the second semester of the seventh year.

From another point of view, commercial courses in the ninth year which are a part of the high-school contribution to the junior high school program of studies are preceded by earlier electives in the seventh year of six centers and in the eighth year of four centers. The commercial electives introduced into the seventh year are typewriting in six centers, business arithmetic in two centers, business writing in two centers, and business forms and stenography in one center each. In comparison with those in the seventh year, the introductory commercial elective courses in the eighth year are far more extensive both in type and in the number of centers offering them. Eight centers offer typewriting in the eighth year; four centers offer business practice or elements of business as defined in the reports or junior business training as defined by some of the recent textbooks; two centers offer business arithmetic; two centers offer bookkeeping; two offer business writing; one center offers commercial geography, and one center stenography.

As has been noted, the seventh-year courses are, for the most part, one semester or less in length, five periods a week.

In the eighth year, typewriting is a full-year subject of five periods a week in three centers, four periods a week in one center, and one period a week in one center. In three other centers typewriting is offered for a half-year, five periods a week. Business practice or junior business training is a full-year course for two, three, four, and five periods a week in three centers, one of which offers two courses; in Okmulgee it is offered as a try-out course of nine weeks, five periods a week. Business arithmetic is offered for five periods a week for a year in one center and for a half-year in one center; bookkeeping is a half-year elective, five periods a week, in the two centers which offer it. Business writing is offered for a full year for five periods a week in one center and for two periods a week in one center. Commercial geography is a half-year elective, four periods a week, in one center. Stenography is offered as an exposure course in the second semester of the seventh year and in the eighth year by Los Angeles, but five periods a week would apparently make it an intensive rather than an exposure course. Incidentally, only three other centers offer stenography in the junior high school, even in the ninth year. Stenography is apparently fast losing the place in the junior high school program of studies which it held ten years ago at the beginning of the junior high school movement.

The problem of adapting commercial courses to eighth-year pupils, and to some extent even to seventh-year pupils, is receiving attention in ten of the fourteen centers. The majority of the junior high schools share, therefore, in a common purpose to adapt commercial electives to grades one or two years earlier than formerly was the practice in the high school. In this problem of adaptation of high-school courses to earlier years several considerations should control experimentation. First, each introductory course should both explore pupils' aptitudes for the course and reveal the possibilities of higher courses in the same subject field. Second, the introductory course should "deal with the simpler aspects, or those of more direct application, in the earlier years and defer the refinements for later years when these can be better appreciated."[1] Third, the first introductory course should be a survey of the subject field rather than a specialized course of the type which prevails in the later years—for example, general mathematics, general science, general social studies, general shop, general home economics, and, in commercial education, elements of business or junior business training.

In the light of these considerations there seems to be little justification in the seventh year for distinct and specialized courses in typewriting or stenography, though the greater facility with which pupils handle typewriting as compared with stenography presents a stronger case for the former. The same considerations raise a question as to the desirability of bookkeeping and stenography in the eighth year. The fact that over one-half of the centers give typewriting in the eighth year is evidence of both the desirability and the practicability of this elective in the eighth year.

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[1] *Cardinal Principles of Secondary Education*, p. 17. Bureau of Education Bulletin No. 35, 1918.

There is a need in the junior high school for a general introductory and exploratory commercial course for at least the eighth year. Such a course should be evolved and adapted to the eighth year before it is attempted in the seventh year. However, there is a serious question whether any electives should be introduced into the seventh year except practical arts for retarded pupils and foreign languages for gifted pupils. The commercial elective which at present appears to give the greatest promise of supplying the need for an introductory and exploratory course is business practice or elements of business or junior business training. When such a course is evolved, it should probably become a required course for all pupils. It is significant that in Pittsburgh a course in business practice is now required for two periods a week in the eighth year in the case of all pupils not electing commercial subjects.

Commercial education, in addition to its distinctly vocational values, has certain general and practical values for all pupils in secondary education. A course in junior business training should contain those fundamental values of commercial and business practice which are the common need of all pupils irrespective of vocational choice. When such a course is available, it should be offered to all pupils in the latter half of the seventh year or the first half of the eighth year or in both to the extent of two or three periods a week.

The two commercial electives on which chief emphasis is placed in the ninth year are typewriting and bookkeeping. Typewriting in the ninth year is preceded by introductory courses in the seventh and eighth years in seven of the nine centers. Typewriting is offered by one center in the seventh and eighth years and discontinued in the ninth year. Bookkeeping is offered for the first time in the ninth year by eight of the ten centers; in the two remaining centers introductory half-year courses are given in the eighth year. The majority of the junior high school centers, therefore, make typewriting an eighth-year elective and bookkeeping a ninth-year elective. The allotment of time to ninth-year typewriting varies in the nine centers which include the subject in the commercial curriculum; the allotment is a full year of work of five periods a week in five centers, of four periods in one center, of two and one-half periods in one center, and of two periods in one center; one center gives five periods a week for a half-year. This variation in time allotments does not prevail to an equal extent in the case of bookkeeping. Seven of the ten centers give bookkeeping five periods a week for a full year; two centers give four periods a week for a year, and one center gives five periods a week for a half-year.

Business writing appears in the commercial curriculum of the ninth year in four centers as a year subject, for one period a week in one center, for two periods a week in one center, and for five periods a week in two centers; penmanship and spelling are offered by one center for a year, five times a week. Penmanship is, therefore, an elective in five centers. Commercial arithmetic is offered as a full-year subject in four centers, five periods a week in three centers and three periods a week in one center. Stenography is a full-year elective, five periods a week, in four centers. Commercial geography, first lessons in business, and office practice are offered as commercial electives in one center each for a full year, five periods a week.

The administration of the ninth-year commercial curriculum in the junior high school shows at present much variation in the types of courses offered and in the allotment of time. The experiment of adapting high-school commercial courses to the junior high school program of studies has probably from necessity taken in its early stages the form of specialized courses transferred as elective units from the senior high school and simplified for junior high school classes. An attempt to fuse commercial courses into a general introductory and exploratory course surveying the commercial curriculum is being made in the courses in business practice and elements of business in four centers in the eighth year and in the courses in first lessons in business and office practice in two centers in the ninth year. This experiment may be followed by other efforts to fuse the commercial work into more general and less highly specialized courses.

The function of the junior high school is to a large degree the determination of the curriculums into which it will sort its pupils. Highly specialized courses characterize the broader differentiation of the senior high school. For the great majority of commercial pupils in the junior high school who will continue their commercial training in the senior high school, a more general and composite course would to a greater degree correspond to the practice of other curriculums. For the minority of junior high school pupils who must seek their vocational placement from the junior high school, the courses in office practice or junior business training, typewriting, and elementary bookkeeping, organized on the basis of making each year's work of value to those who go no farther, that is, on the year-unit basis, will give all of the commercial training which those who leave school during the junior high school period can take without too great sacrifice in the case of the core curriculum of health, English, social studies, science, and the fine and practical arts.

This report definitely recognizes the fact that the suggestion of more general units of instruction in the commercial curriculum of the junior high school is presented almost entirely from the standpoint of its desirability. The practicability of general units of commercial courses is, however, demonstrated by the existence today of elementary courses in junior business training or first lessons in business. The implication at least seems clear that this introductory and exploratory course might be extended as a general or composite course for the ninth year and that such a course might fuse into one unit of instruction the essentials of the specialized courses now offered in the ninth year—for example, office practice, bookkeeping, commercial geography, business writing, and possibly commercial arithmetic, if the latter is not fused with a general mathematics course. Typewriting, because of its distinct equipment, will probably persist as a separate unit of instruction.

Table XXII conclusively demonstrates that commercial education has found a permanent place in the junior high school program of studies. The junior high school should initiate by means of general and elective units of instruction all senior high school curriculums and thus meet its chief duty, namely, intelligently to guide all of its pupils to their proper placement in the educational differentiation of the senior high school. Educational guidance for those who will continue and vocational guidance for those who are to leave school are clearly the chief objectives in the administration of the junior high school program of studies. The commercial curriculum in common with other junior high school curriculums should conform to these accepted principles in the organization of the program of studies.

It is apparent, therefore, that the second half of the seventh year and possibly the first half of the eighth year should include a required introductory and exploratory course in junior business training or the elements of commercial education. Other curriculums are now preceded by similar required units of instruction—for example, general shop or general home economics in the case of industrial, home economics, and vocational curriculums; general mathematics, general science, and some practical arts training for the technical curriculum; required courses in the fine arts for the fine arts curriculum; and seventh- or eighth-year elective foreign language courses which result in try-out courses for the academic curriculum.

It is doubtful whether specialized courses should be offered as electives in the seventh year except for the small minority of those leaving school who rarely can be wisely segregated as early as the seventh year.

The course in junior business training should be offered throughout the eighth year or in the second half of the eighth year as an elective for those pupils whose interests and aptitudes are shown to be in commercial branches. The practice of making typewriting an eighth-year elective is followed in over one-half of the 6-3-3 organizations. Specialized commercial courses might be offered in part of the eighth year and in the ninth year for those who are to leave school at the end of the junior high school period. However, only the large schools can meet the needs of this minority of commercial pupils without serious interference with the more general courses which should be offered to the majority of commercial pupils who will continue into the senior high school.

In the ninth year for the present at least bookkeeping and typewriting will persist as the major commercial electives. When junior business training is adopted as both a required exploratory course and as an elective course in the seventh and eighth years, it may become possible to extend it into the ninth year as a progressively organized general commercial elective. In fact, junior business training courses have been prepared in textbook form for a progressive elective throughout the junior high school. Typewriting is offered as an elective in the ninth year in nine centers and will doubtless persist as a ninth-year elective.

In each curriculum it should be the purpose of the junior high school to promote the continuance of its pupils into the same curriculum of the senior high school. Therefore, the junior high school commercial curriculum should be constructed in expectation of the continuance of the majority of the pupils into the senior high school. In accepting this principle in the organization of junior high school commercial courses it is not necessary to disregard the year-unit basis of organization. "Each subject should be so organized that the first year of work will be of definite value to those who go no further; and this principle should be applied to the work of each year."[1] Strictly, the two principles of year-unit organization of courses and of deferred value of senior high school courses may be interpreted to mean, as here suggested, general introductory courses organized in the junior high school on the year-unit basis and highly specialized courses in the senior high school.

The commercial teachers of the fourteen centers included in their reports information with regard to the subjects of the core curriculum which are required of commercial pupils. A summary of the reports shows that English is uniformly required for the full allotment of time in all three years. Social studies is required in either the eighth or the ninth year or in both years when commercial electives are offered. Science is required in approximately one-half of the centers, usually for one year of two to five periods a week. General mathematics or algebra is required in ten centers. More than half of the centers require the commercial pupils to take practical arts. Geography is required in only five centers and usually as commercial geography. In most centers geography is completed before commercial electives are offered. Foreign languages appear as electives in three centers and in these cases are optional with some commercial elective.

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[1] *Cardinal Principles of Secondary Education*, p. 17. Bureau of Education Bulletin No. 35, 1918.

There is little uniformity of practice in the core curriculum required of commercial pupils in the fourteen centers. The one exception is the English requirement. Commercial electives have been so numerous in most of the centers as seriously to limit the core curriculum, particularly in the eighth and ninth years. The situation invalidates the practice of integrating the junior high school program of studies by a body of constants required of all pupils through the three years. The junior high school should not be stratified by exclusive and self-contained curriculums. There should be major units of instruction—for example, English, social studies, mathematics, science, fine and practical arts, and health—common to all curriculums. In other words, the major portion of the junior high school program of studies should consist of constants which will integrate the program of studies, and the minor portion should consist of electives which will initiate the differentiated curriculums of the senior high school.

Those who are to leave school during or at the end of the junior high school period are the one group of pupils who must to some extent be deprived of the socially integrating influences of a major body of constants. These constants, however, should be required in identity of content and time allotment of all pupils continuing into the senior high school. Vocational curriculums of either an industrial or commercial type necessarily result in a reduction of the time allotment to constants, but vocational curriculums do not necessarily eliminate constants.

The evolution of general commercial courses for the junior high school and the restriction of time allotments to commercial electives on a basis equal to that of other electives will promote the organization of a body of constants in the program of studies and thus increase the socially integrating influence of the junior high school. A core curriculum will then be common to all pupils however they may be differentiated in their minor preferences for academic, technical, commercial, industrial, or fine arts electives. There are pressing and serious problems in the present administration of the junior high school commercial curriculum which deserve further study by a more extended inquiry than was planned for this investigation.

ENGLISH

The English electives at Okmulgee are in part finding and broadening courses offered as try-out courses in the seventh and eighth years. Superintendent H. B. Bruner discussed his program of finding and broadening courses at the Cleveland meeting of the Department of Superintendence of the National Education Association in February, 1922; his discussion will be found in the proceedings.[1] A year course is offered in the ninth year for pupils who excel in the try-out courses in public speaking.

The electives in English at Los Angeles are offered to the ninth-year pupils who desire extra training in constructive written composition or in oral English. Library practice is an intensive course of six periods a week for the full ninth year.

The experiment of English electives is unique in these two school systems among at least the fourteen co-operating centers. It is doubtless true that the experiment is no more extensive generally. Judgment of the desirability and practicability of English electives in the junior high school should be suspended until the practice becomes more general. It is at least significant that English electives have found a place in the program of studies of Los Angeles and Okmulgee.

English majors are offered in higher institutions for both their cultural and their vocational values. Possibly similar electives in a simplified form may be both practicable and educationally and vocationally valuable for secondary-school pupils.

HOME ECONOMICS

Electives in home economics are offered in one or more of the seventh, eighth, and ninth years by each of the fourteen centers. Five centers offer electives in the seventh year, eight centers in the eighth year, and thirteen centers in the ninth year. Five centers offer electives in the ninth year only; seven centers offer electives in both the eighth and the ninth years; three centers offer electives in all three years.

A comparison of Tables XIX and XXII reveals extensively varied practice. In the seventh year three centers give both required and elective courses; eight centers give required courses only; and two centers give elective courses only. In the eighth year six centers give both required and elective courses; three centers give required courses only; and two centers give elective courses only. In the ninth year two centers give both required and elective courses; one center gives only required courses; and eleven centers give elective courses only. There is a majority vote in only two instances—required courses only in the seventh year and elective courses only in the ninth year.

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[1] "The Superintendent and the Course of Study," *Addresses and Proceedings of the National Education Association*, LX, 1431–34.

That home economics has been given a place in the junior high school program of studies is conclusively shown by Tables XIX and XXII. That the practice as to required or elective courses has not become stabilized is demonstrated with equal conclusiveness. The extensive variation has produced confusion in the organization of junior high school courses in home economics and will lead to possibly greater confusion until a more comprehensive investigation determines clearer distinctions between the common need of all junior high school girls for home economics and the special needs of those who have special interest in or aptitudes for home economics.

Distinctions of needs clearly drawn will tend to lessen the present confusion between required and elective courses, since the former should be required of all pupils and the latter offered to those who elect special training in home economics. When required courses only are offered in the eighth year, some pupils are deprived of the privilege of eighth-year home economics electives which are equivalent to the electives in the academic and commercial curriculums. When elective courses only are offered in either the eighth or the ninth year, the common need of all girls for a progressive course in home economics throughout the junior high school is sacrificed.

The time allotments to electives in home economics with respect to both the number of weeks a year and the number of periods a week reflect as widespread variation as the situation with regard to required and elective courses. In the seventh year the number of weeks varies from nine to forty, that is, from a quarter-year to a full year. There is apparent, however, a general purpose to make seventh-year electives try-out or exploratory courses to a large degree, since the quarter-year electives are given for five periods a week and the full-year and half-year electives for one, two, three, and four periods a week. Yet this purpose is not clear in all centers, since by grouping electives seventh-year girls in three centers may elect a maximum of four to six periods a week. The needs of overage girls in the seventh year may warrant intensive home economics electives in the first year of the junior high school. Definitely ascertained individual needs can alone determine the alternative of intensive try-out courses for seventh-year pupils.

In the eighth year there are four quarter-year electives of five periods a week, three half-year electives of five periods a week, and five half-year electives of one to three periods a week; there are fifteen full-year electives varying from one to eight periods a week. Both try-out and intensive home economics electives are apparently offered by these varied time allotments. It is exceedingly difficult to distinguish how far each elective is determined by the clearly ascertained needs of the group of girls electing the course. Again, it is clear that home economics has found a place in the junior high school program of studies and equally clear that it is not yet definitely determined what that place shall be. In the absence of any extensive investigation to aid in the stabilizing of practice, it is not strange that such varied practices exist, particularly in subjects so comparatively new to the curriculum as the practical arts.

In the ninth year, electives in the majority of the centers may be grouped by girls electing to specialize in home economics to the extent of one to two periods a day for a full year. In this respect there is uniformity of purpose to offer intensive courses in home economics to girls who by aptitude and interest prefer a home economics major elective to other electives in the ninth year. The same grouping of electives, to the extent of making a major elective, is also possible in the eighth year of six centers.

The range of variation in time allotments of both required and elective courses in home economics suggests the inference that time allotments are first fixed for the traditional subjects of the curriculum and the balance of the time schedule allotted to the practical arts and the fine arts. Makers of programs of studies, if entirely frank, would admit the present preponderating influence of traditional practice. New courses of study are inevitably forced to this unequal competition for a just share in time schedules. There is a vital need to determine the actual educational values of comparatively new courses of study in the administration of the curriculum and on this evaluation to base the types of new courses and the time distribution. Until this evaluation and stabilizing of time allotments can be effected by a comprehensive program of curriculum readjustment the present confusion in evaluation and the present varied practice of time distribution are sure to persist.

The types of home economics electives are far more uniform in the fourteen centers than the types of industrial arts electives. Table XXII shows five types, namely, clothing, foods, home and family, textiles, and millinery. In this respect home economics courses have become generally uniform. They are not uniform with respect to time allotments and with respect to their character as constants or electives.

Required courses in home economics, if conditions with respect to traditional subjects and college-entrance requirements can be adjusted, should be coextensive with the full three years of the junior high school. The average time allotment is between two and three periods a week in the seventh and eighth years and about the same in the ninth year in the junior high schools which require home economics in the ninth year.

Electives are offered in home economics in the seventh and eighth years apparently for two reasons: first, because the time schedule does not permit the requirement of the subject and, second, because the schools aim to provide exploratory or try-out courses. The first condition should not be permitted to continue, and the objective of exploratory or try-out courses is usually achieved in other subjects not by electives but by constants required of all pupils.

The general purpose of an elective is to provide additional work for those who have aptitude and capacity for the elective. In the fourteen centers investigated the home economics electives comply with this general purpose to some extent in the eighth year and almost entirely in the ninth year. The types of courses are well established. The time allotments to home economics electives in the eighth and ninth years should be fixed largely by the time allotments to electives in other curriculums. Practically equivalent time allotments to the electives of all curriculums, except in the case of vocational electives, will promote the organization of a core curriculum which should be commonly required with all differentiated electives.

Industrial Arts

One is impressed with the formidable variety in the types of industrial arts electives: seven types of electives in the seventh year, eighteen in the eighth year, and twenty-one in the ninth year. The magnitude of the problem of adapting the actual shop practices of the industrial world to courses of study in the secondary school is equally impressive. That this problem has required long experimentation should occasion no surprise. No other course of study in the curriculum has been confronted with as involved a problem of adapting the practices of society to educational processes. The present experiments, however, in commercial education and in social studies are due to similar problems of adapting varied commercial and social practices to educational use. In fact, the whole curriculum is confronted with as yet unsolved problems because of the tremendous significance of the change in point of view from disciplinary to social and practical values in education.

The situation is effectively summarized by Charles H. Judd as follows:

> There is a new spirit in elementary education; it is the spirit of attention to practical needs. It has slowly but surely penetrated the conservatism of the course of study. . . . . The fact is that school reform is rendered inevitable by social progress and rendered difficult and slow by lack of assimilative power on the part of the school. . . . . If one says that the range of studies offered to ordinary boys and girls must be enlarged to meet the increased responsibilities of modern life, there will be no dispute. If one says that schools must become more intelligent in preparing their pupils for life, again there will be no one to deny the truth of the assertion. . . . . It may be that the process of adding a little here and subtracting a little there is all that our school system is ready to undertake. . . . . It certainly would be more expeditious and more economical of human energy if we could devise some way of reconstructing the school program on the basis of a national consideration of the demands of modern life.[1]

No apologies are offered or needed for the oft-repeated reference to the imperative need of an extension of the present study, for it was the purpose of this investigation to demonstrate the indisputable need of a comprehensive and nation-wide program of curriculum readjustment and to find out how far school systems will welcome the opportunity to co-operate. The variations of curriculum practice in every course of study, as pointed out in this report, demonstrate the need of further investigation, and the self-sacrificing professional spirit of the administrators and teachers in the fourteen centers included in this investigation proves a widespread willingness to co-operate.

In the case of the industrial arts there are additional reasons for the variety of electives offered in the fourteen centers. One should not forget that the industrial expansion of the past fifty years presents today a bewildering variety of activities to those who are attempting to formulate courses of study in industrial arts. Furthermore, every system of schools is wholly justified in its effort to have industrial arts electives reflect the local industrial interests of the community.

The Smith-Hughes subsidy has resulted in concentrating the energies of industrial education leaders and instructors on the vocational courses which receive subsidy aid. There have come, therefore, clear lines of demarcation between vocational education for those leaving school in the junior high school period who need intensive occupational training for placement in industry and general industrial arts designed to meet the needs of the great majority of boys in acquiring manual skill, in becoming familiar with the common everyday demands for mechanical knowledge, in preparing for useful service in the home and for the avocational pursuits which so frequently in the case of men and boys take the form of manual or mechanical interests, and in acquiring a sympathetic understanding of the great industrial expansion by which modern life is both surrounded and conditioned.

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[1] Charles H. Judd, "Fundamental Educational Reforms," *Elementary School Journal*, XXIII (January, 1923), 336, 337, 339, 341.

The problem of equipping a special vocational shop is one of adapting the shop conditions of the particular industry to a school environment, and the problem of selecting an instructor is a matter of finding someone who has had experience in the particular industry and has in addition personality and adaptability. Federal and state subsidies have stimulated the rapid development of vocational shops.

On the other hand, the problem of equipping a general shop for industrial arts training is comparatively involved because of the varied industrial interests included. The instructor who can adequately meet the tests of the varied industrial activities in a general shop is seldom the product of actual industrial specialization. The difficulty of finding instructors adapted to a general shop has discouraged many an administrator from introducing industrial arts courses. Conditions, therefore, have favored the rapid evolution of the special shop and impeded the development of the general shop.

The situation has raised the question in many school systems as to whether a course in general shop should be offered as a required subject to all junior high school boys or a succession of courses in special shops on a rotating and progressive plan. Both practices prevail. Where the vocational needs of a group of boys demand a particular vocational shop for only a part of the school day, economy in administration requires that the shop be used for industrial arts training when not needed for a vocational class. The special types of shops are, therefore, practicable for the larger schools but prohibitive in expense for the smaller schools. The latter are forced to adopt a general-shop type of organization.

If general industrial arts training is to reflect conditions of industrial life and to prepare boys for actual life-needs in their own experience, it should extend beyond manual training or woodwork, particularly in the junior high school. Consequently, the general shop or courses in home mechanics or household mechanics offer opportunities for a progressively organized course in woodwork, metal-work, electricity, sheet metal, elementary machine shop practice, and other advanced industrial training which will win the respect and sustain the interest of junior high school boys. The varied types of special and general industrial arts courses shown in Table XXII reflect a recognition of these demands and efforts to meet them. A small proportion only of the special shops provide for a time allotment which would comply with the Smith-Hughes requirements. The inference is clear that the great majority of electives are offered for industrial arts training in curriculums which do not have placement in industry as their immediate objective.

Table XXII also reveals much variation in both the length of the courses and the weekly time allotments. In the seventh year there are seven full-year electives of five periods a week, four full-year electives of one to three periods a week, two half-year electives of four or five periods, and three quarter-year try-out electives of five periods.

In the eighth year, there are fifteen full-year industrial arts electives of five periods a week and seven Smith-Hughes vocational electives of a full year for a half-day five times a week; there are four full-year industrial arts electives of one, two, three, or four periods a week; there are two half-year electives of five periods and four half-year electives of four periods; there are three quarter-year electives of six periods and sixteen quarter-year electives of from two to five periods a week.

In the ninth year there are two full-year electives of six periods a week, twenty-seven full-year electives of five periods a week, and seven full-year electives of from one to three periods a week; there is one half-year elective of five periods a week and four half-year electives of from two to three periods a week; there are fourteen quarter-year electives of from two to five periods a week; there are twelve full-year vocational courses of the Smith-Hughes type.

The purpose of the full-year half-day vocational courses is entirely clear. The purpose of the full-year electives of five periods a week which predominate in both the seventh and the eighth years is to offer either an elective to technical-curriculum pupils or an elective to boys of other curriculums which is equivalent in time allotment to other subject electives. This predominating practice is evidence of a clearly defined demand on the part of junior high school boys for industrial arts training on a par with the demand for other electives of the program of studies. A similar objective in curriculum construction must prevail in the case of other full-year industrial arts electives of less than five periods a week and in the case of half-year electives of five periods a week.

The exigencies of the time schedule and of the schedule of classes apparently determine to a large degree the number of periods a week.

The purpose of half-year courses of less than five periods a week and of all quarter-year electives must be to offer in rotation try-out courses of a semester or a half-semester in length. As has been pointed out in connection with home economics, the try-out or exploratory purpose in other subjects of the curriculum is achieved through a general course required of all pupils. It is easy, however, to understand that the preference of some school systems for special types of shops favors a try-out or elective plan of rotating shops rather than a required general-shop practice.

There is evident, both in the types of electives and shops and in time allotments, wide variation of practice in industrial arts. Conditions have been noted which account for the variation. Greater uniformity of practice will come with further study of the actual objectives and of the types of courses and shops and with the determination of the actual needs of pupils. The present situation is in desperate need of an extensive investigation which will help to stabilize practice. As in the case of home economics, the industrial arts have found a place in the junior high school program of studies, but it is not yet entirely clear what that place shall be. However, complete uniformity of practice is probably undesirable since the courses in industrial arts should reflect the industrial interests of each section of the country and of each community.

New courses of study usually find their way into the curriculum first as electives and later as required courses when in the process of evolution they become adapted to the common needs of a large pupil body. Tables XIX and XXII plainly indicate that there are industrial arts courses in both stages of development. It is to be hoped that the present tendency to include industrial arts in the core curriculum for general educational purposes will continue. Fine and practical arts should in time become co-ordinate with the five major branches—English, mathematics, social studies, science, and health. This development of large major units of instruction will do much to relieve the junior high school of the charge frequently made against it that "it attempts so many subjects that it distracts its pupils."

Electives in industrial arts have no place in the seventh year except as try-out courses to precede the later development of a required industrial arts course or to meet the needs of those who leave school in the junior high school period. Industrial arts electives should, however, be offered when pupils are permitted to choose between other electives. Whenever other electives are offered in the eighth or ninth year, industrial arts electives should be included as optional courses for those pupils whose objective may be a technical course in the senior high school or other higher institution and for those pupils who have time for enrichment courses with other required and elective work. In the case of those who are to leave school vocational electives should be offered in all three years in those junior high schools where the school system provides no other alternative in a special trade school or in a vocational curriculum of a high school. Moreover, vocational electives are most intelligently and effectively administered as individual pupil problems.

Required industrial arts courses in the core curriculum of all three years of the junior high school should result in reducing the electives in industrial arts to the basis to which electives in other subjects have been reduced, that is, not as alternatives of required courses but as specialized electives for those pupils whose needs and educational or vocational aims demand industrial arts training. Yet electives in other subjects serve as enrichment courses for pupils whose achievement records and schedules of classes permit of additional elective work. Industrial arts to a very limited degree, therefore, will be likely to persist as extra-elective subjects for some pupils.

LATIN

Latin is offered as an elective in one or more of the three years of the junior high school in each of the fourteen centers—in the seventh year of four centers, in the eighth year of eight centers, and in the ninth year of all centers. Cleveland, Denver, and Somerville offer a Latin elective in each of the three years. Kansas City, a 7-4 school system, offers Latin in the seventh and ninth years. Detroit, Los Angeles, Okmulgee, Pittsburgh, and Rochester offer Latin in both the eighth and ninth years. Five centers only continue the practice of introducing Latin in the ninth year. A high degree of uniformity prevails in the allotment of time both in the number of weeks a year and in the number of periods a week. All of the electives are for a full year of five periods a week with the exception of three half-year courses and two full-year courses of four periods a week.

Nine of the centers complete the beginners' Latin book at the close of the ninth year, as has been the usual practice for many years; two centers complete the book at the end of the eighth year and one center at the end of the seventh year; two centers complete the beginners' book at the close of the eighth year in the case of those classes which begin the work in the second semester of the seventh year and at the close of the ninth year in the case of those who begin in the first semester of the ninth year. Nine of the centers, therefore, do not advance the completion of the traditional first-year Latin work in spite of the fact that four of the nine centers give from a half-year to a full year of work in the eighth year. Cleveland and Denver complete the first-year Latin work after the three semesters in the second half of the seventh year and all of the eighth year. Los Angeles completes the work after one full year in the eighth year and Somerville after two years of work in the seventh and eighth years.

The following comments made in the teachers' reports are of importance in discussing variations in practice:

Atlanta.—[Atlanta offers a Latin elective in its eighth year, which is the first year of the high school.] Since our first year of Latin consists in the teaching of the first-year book, I do not see that any changes could be made in this year; otherwise the Latin necessary for the continuance of the course would not be taught.

Berkeley.—Time to give a small Latin play in some good classes would be appreciated as well as more time for the reading of such books as *Ad Alpes* by Nutting.

Birmingham.—I would like to see a separate course worked out for those students who intend to take Latin for two years only. Such a course would admit of greater variety in reading material during the second year and would also give time for greater emphasis on the relation between Latin and English.

Cleveland.—[Cleveland offers Caesar to the junior high school class which completes first-year Latin at the close of the eighth year.] In our Caesar classes we use a simplified version of Caesar in addition to the original text. We would substitute some other reading for Caesar.

Decatur.—We recommend the introduction of an elementary Latin reader after completing the beginners' book and before taking up Caesar's Gallic Wars.

Denver.—[The beginners' Latin book is actually completed in the middle of the second semester of the eighth year, followed by Nutting's Latin reader and Ritchie's stories, etc., from the front of D'Ooge and Eastman's *Caesar in Gaul*. Denver also uses Sanford and Scott's *Second Latin Book for Junior High Schools*.] The committee working on the revision of the curriculum feels that the 7-2 Latin should be less formal and have more background work than heretofore—more the type of work shown in Gray's books.

Detroit.—Four semesters of language work in the junior high school is equivalent to three semesters in the senior high school. [Detroit uses Sanford and Scott's *Junior Latin Reader* in the second half of the ninth year.] We recommend more easy reading and more interesting material—more time to create a background for Latin and to correlate with everyday life. [Detroit is the only center which offers a general language course; this is an exploratory try-out course in the first semester of the eighth year. The course is in the initial stage of experiment; it is described in part in connection with the discussion of the modern languages.]

Kansas City.—Owing to the fact that we do not have a sufficient number of junior high schools, many of our pupils finish the seventh grade in the ward schools and consequently cannot take beginning Latin until the ninth year. The work of beginning Latin in the ninth grade is the same as in the seventh grade. [Caesar is offered in the ninth year to the pupils who take first-year Latin in the seventh year; Kansas City has no eighth year.]

Los Angeles.—We would like several changes, one of which is much more easy reading—of a classical type, not just made Latin—for all grades. (*Ora Maritima* is used as supplementary reading in the eighth year. Nutting's Latin reader, *Fabulae Faciles*, Latin plays, selections from Ovid, etc., are used in the ninth year. The following projects or problems are included in the junior high school Latin courses: vocabulary, verb forms, and declension games; trees or some other device to show English derivations; comparative view of conjugations; vocabulary contests; contests in accuracy; production of Latin plays; and finding Latin in inscriptions, advertisements, journalism, art, literature, etc.)

Okmulgee.—We are considering the advisability of postponing the reading of Caesar to the second semester of the second year and the early part of the third year. Each pupil is responsible for Latin quotations, clippings from newspapers, pictures, and advertisements—in fact, anything which shows the influence of Latin—for our bulletin board. In the eighth grade lists of Latin abbreviations, derivatives, books about Roman or mythological characters, Latin expressions heard or read in the papers or on moving-picture screens, etc., are kept. Time in English classes is given to the study of prefixes, suffixes, root words, etc.

Pittsburgh.—*Fabulae Faciles* and *Viri Romae* are used as supplementary texts in the second semester of the ninth year. We encourage the learning of current Latin phrases and Latin proverbs and the use of Latin in the business world—for example, in advertising, pupils bring in advertisements which show the use of Latin words or show Latin influence. I wish it were possible so to organize the work and the classes that the slow pupils might do from 8-1 to 9-2 the work which the brighter pupils do from 8-1 to 9-1. Many pupils fail in Latin not because they cannot learn Latin but because they cannot master it within the time limit we assign.

Rochester.—In 8 B and 8 A the Latin period of thirty minutes is part of a sixty-minute Latin-English period. [Among the fourteen centers Rochester is unique in this practice of co-ordinating Latin and English in the same period and with the same teacher.] The pupil is urged to note and bring in all references to Rome, Roman life, habits, religion, etc., found in his reading of books, newspapers, and periodicals. These are pasted on charts and hung in the classroom. The notebook is one of the essential and valuable features of work in all terms. It is divided into sections: Project 1, clippings containing pure Latin phrases; Project 2, clippings containing Latin words commonly thought to be English; Project 3, English derivatives based on Latin vocabulary; Project 4, list of

Latin words with English derivatives to assist in the solution of their meaning; Project 5, English words the spelling of which is affected by their derivation. Part II of the notebook is for references of all kinds, pictures, advertisements, etc.

St. Louis.—Pupils bring in lists of musical terms closely related to Latin or lists of words met in botany, physiology, or other studies which appear to be of Latin derivation. Charts illustrating such subjects as "Latin Expressions in Daily Life," "The Lawyer's Use of Latin," "State Mottoes," etc., are made by the pupils. Short Latin plays are given by the members of the class. We have a Latin Club which studies the history and customs of the Romans, prepares short Latin dialogues or sketches, and spends some time in vocabulary matches and the study of derivations. I should suggest no important changes in the first-year course until there shall be available a first-year Latin book made up of easy graded reading material with study forms and rules based on the reading matter.

Somerville.—[Ritchie's *Fabulae Faciles* is used as supplementary reading in the ninth year.] We have a Latin Club in which interest is directed toward anything pertaining to Roman life and customs. [Latin games of various types are used in all three years. Somerville has, in addition to the ninth-year work, a seventh-year class, a combined seventh- and eighth-year class, and a second-year Latin class in the eighth year.]

The introduction of Latin courses into the seventh and eighth years of the junior high school and the adaptation of Latin courses to these years have been accompanied by many varied plans to provide the background of first-year Latin, to vitalize a so-called dead language, and to motivate the pupils' study of Latin by an introductory view of Roman life and customs and by the gathering of present-day evidence in many varied forms that Roman civilization and the Latin language are still alive in a changed and modern life and speech. All of this introductory work takes time and explains in part why so few centers attempt to advance the time of completing first-year Latin before the end of the ninth year. The quotations reveal a practically unanimous purpose to make Latin study a more effective instrument in secondary education.

The rebellion against Caesar as the sole required reading following first-year Latin is so general in the fourteen centers that already alternative reading texts have been adopted by several centers for eighth- and ninth-year courses, and the desire for easier reading is expressed by others. Possibly the fearful toll of mortality among first-year and second-year high-school pupils caused by Caesar's Gallic Wars may be largely prevented by more reasonable, better motivated, and better adapted courses in the seventh and eighth years preparatory to the work of the former first and second high-school years.

The tendency to abandon Latin which has characterized the administration of the secondary-school program of studies in the past fifteen years should be checked before Latin goes the way of Greek. The hope of conserving the place of Latin in the program of studies may lie, at least in part, in the types of courses which are finding their way into the first two years of the junior high school. The English language and twentieth-century civilization owe too much to the Latin language and to Roman civilization to consign Latin to the educational scrap-heap. There will always be a group of secondary-school pupils whose intelligence quotients prove that they are capable of profiting from Latin courses, whose education will be incomplete without first-hand knowledge of the Latin origin of their own daily speech and the literature of most of the peoples they will read, and who cannot intelligently interpret present-day social life and modern civilization without intimate knowledge of Roman life and civilization. Latin has too long persisted in the program of studies to be summarily dismissed without a hearing. The mistake has not been that Latin has been a part of the curriculum but that it has been required of countless multitudes of secondary-school pupils who should never have been permitted to take the subject because of ineptitude for Latin, incapacity to master it, or a complete lack of any need for it.

Hope for the persistence of Latin is found in the extracts from the reports of the fourteen centers and in the varied types of experiments now being conducted in these fourteen cities and in many other junior high schools to construct introductory courses for the seventh and eighth years. These courses will prepare the way for the first-year and subsequent courses of secondary-school Latin. Moreover, their preparatory try-out purpose will aid, through the effective operation of a selective medium, in decreasing the educational mortality due to wholesale and unwise election of Latin.

MATHEMATICS

Berkeley reports no required mathematics in the ninth year but offers an elective in algebra.

Decatur offers in the ninth year an option between algebra and commercial arithmetic.

Kansas City notes that algebra is elective in the ninth year but that it is required for graduation from the senior high school. Therefore, all junior high school pupils who continue into the senior high school elect algebra.

Okmulgee reports no required mathematics in the ninth year but offers a choice between algebra and general mathematics.

St. Louis, commenting on a similar option in the ninth year, says:

> General mathematics is recommended to those pupils who expect to take mathematics only one or two years; algebra to others. Pupils who take either course for a year are admitted to geometry in the senior high school. Those who take algebra in the junior high school are, on the completion of the work in geometry, permitted to take Algebra 3, the third half-year of algebra; those who take general mathematics are permitted to go into Algebra 2, the second half-year of algebra.

St. Louis makes a statement which goes far toward explaining the slow introduction of general mathematics beyond the first two years of the junior high school:

> The tendency seems to be to have the pupils of higher mentality choose algebra, although they are not advised to do so by the teachers. In this school [the Ben Blewett Junior High School] the tendency in general seems to be for children whose parents have had a high-school or college education to choose algebra; in other words, tradition plays a part in the choice.

Modern Languages

Of the twelve centers which offer modern languages during the junior high school years, all offer French in one, two, or three years, and eight offer Spanish in one, two, or three years. Thus eight centers offer both French and Spanish, and four centers give French only.

Four centers offer French in each of the seventh, eighth, and ninth years; four centers offer French in both the eighth and the ninth years; and four centers offer French in the ninth year only. Practice is, therefore, equally divided into three varied programs. The time allotments are full-year courses in all three years with the exception of a half-year course in the seventh year; with three exceptions, the courses require five periods a week.

Four centers offer Spanish in each of the seventh, eighth, and ninth years. Kansas City gives Spanish in both the seventh and the ninth years, which are consecutive because of the 7-4 organization. Two centers offer Spanish in the ninth year only.

The procedure is the same for Spanish as for French in each center which gives both languages. The time allotments in Spanish show the same general uniformity as prevails in the French electives. Full-year courses of five periods a week are required in all but four of the Spanish electives. Two courses are half-year courses and two are full-year courses of only four periods a week.

It has been frequently thought that Spanish is largely restricted to those sections where Spanish is in use by a large proportion of the population. It is true that the four centers of the Pacific Coast and the Southwest offer Spanish, but there is one center which offers Spanish in each of four other sections, namely, the Mountain section, the South, the Middle West, and New England. In the limited extent of this investigation inferences are not safe, but the question is raised as to whether Spanish electives are a response to sectional needs or a substitute for German so generally offered as a modern language elective prior to the world-war.

The centers vary in their practice mainly as to the number of years in which modern languages are offered in the junior high school program of studies. Cleveland gives the following outline of its program of three consecutive junior high school years in modern languages, which, with some modification, is likely to be the practice of the other centers which give three years of modern languages:

> The report includes two groups of pupils: (1) Those who begin a modern language in 7 A (second semester). They may drop it at the end of 8 A and receive credit for one year of work in the senior high school but none for high-school graduation. They may continue it through 9 A and then receive credit for two years of work in the senior high school and credit for one year toward high-school graduation. (2) Those who begin a modern language in 9 B and continue it through 9 A. These pupils receive credit for one year of work in the senior high school, and this work also counts toward high-school graduation. The second group covers in two terms the same amount of work that the first group does in the three terms—7 A, 8 B, and 8 A.
>
> The choice of electives is as follows: A child may elect a language in 7 A. In 9 B he has an opportunity to make one of two elections: either he may elect a new language and continue the one begun in 7 A or he may drop the one begun in 7 A and elect a new one combined with another subject.
>
> It is expected that pupils who elect a language in 7 A have received a grade of G (80–90) in English in 7 B. This is not true for pupils beginning a new language in 9 B.

Cleveland's administration of a three-year program of foreign languages (the same procedure obtains in Latin) is a logical and suggestive one for those junior high schools which can give three years to foreign languages. If the practice prohibits the development of a comprehensive core curriculum and the integration of the junior high school program of studies, there is serious question of the desirability of the practice even though Cleveland and other junior high school centers have effectively shown the administrative practicability of the plan.

On the other hand, if the electives in the eighth year and the last half of the seventh year are offered as courses additional to the core curriculum required of all pupils, the practice is commendable as a means of enriching the curriculum for those pupils whose ability justifies additional courses. This practice, however, deprives pupils beginning a foreign language in the ninth year of the preparatory and background courses for which there has been a long-felt need in all foreign languages. It would seem advisable, therefore, to modify the practice to the end of offering in the eighth year or in the second semester of the eighth year a course which parallels in purpose the 7 A course; both groups of pupils would thus benefit by the primary objective in introducing foreign languages into the first two years of the junior high school, namely, the orientation of foreign languages through preparatory and background courses.

There can be little doubt of the wisdom of foreign language electives in the seventh and eighth years if precautions are taken to restrict the electives to those pupils whose ability to take additional enrichment electives has been clearly demonstrated. However, early electives and any other type of early differentiation are likely to invalidate some of the primary and fundamental purposes of the junior high school—the construction of general units of subject-matter for the exploration of aptitudes and capacities and for the revelation of the ability to go on with higher education. The junior high school is both a sorting or trying-out stage of secondary education and a motivating agency for later courses. Second, there is incumbent on the junior high school an obligation to continue elementary courses of study to the point where they merge gradually and fully into the secondary courses and, further, to continue in a gradually diminishing degree the democratic and socially integrating administration of the elementary-school curriculum.

A core curriculum common to all junior high school pupils for the full three years is the inheritance which the junior high school receives from elementary education. On the other hand, a program of electives and differentiated curriculums is the inheritance which it receives from the senior high school. The junior high school is confronted not with the choice of these inheritances as alternatives but with the problem of articulating the two types of curriculum administration. Thus it will actually function as the transitional unit of the 6-3-3 organization to articulate and weld together the public school system. Tendencies, therefore, toward disintegrating and stratifying the junior high school, particularly in its first year, are dangerous menaces to its chief mission in the public school system. If foreign language electives in the seventh year can be prevented from developing such tendencies, they can become helpful media in solving the problem of an adequate curriculum for the supernormal group.

Four centers give only eighth-year courses preparatory to the traditional first-year French course in the ninth year. Pittsburgh distinguishes between the objectives of the eighth- and ninth-year courses thus:

> In eighth-year French the chief objective is to give the pupil freedom and ease of speech in French, a knowledge of the beginnings of grammar, and a fair-sized vocabulary, and also to show the customs of the French people. In ninth-year French the chief objective is a thorough study of the fundamentals of grammar and ability to translate freely from one language to another.

This purpose to make the eighth-year course one of background preparation and orientation is the same objective which so generally prevails in introductory Latin courses.

Detroit is unique among the fourteen centers in the organization of a general language course. It has not been adopted for general use in the intermediate schools because it has not yet passed the purely experimental stage. The experiment will be of interest to all junior high schools, and for this reason a description of the general language course as given in Detroit's report is quoted:

> As a basic course preceding intensive work in any one language the pupils should have a general language survey in order that they may see for themselves the significance of foreign languages and acquire the interest needed for a profitable study of any foreign language.
>
> This general language course begins with the study of the origin, nature, and function of language, leading up to the study of the origin, development, and changes of the English language, a study of its elements and its relation to other languages; an effort is made to show the grammatical structure of the language, how and why grammar is a necessary part of logical language; it includes a study of etymology to enrich the vocabulary and shows the composite structure of many English words; there is an effort to show pupils the value of language power both for thinking and for communicating thought.
>
> This course is simply the A B C of philology.
>
> To bring this large amount of material within the range of eighth-grade pupils we proceed from the known and little by little develop the unknown and build up the course. We stimulate interest in well-known words, such as "automobile," "autograph," "telegraph," etc. We thus start lists of words that the pupils will increase with a real understanding of their meaning. We study the principal Greek and Latin word-stems as well as prefixes and suffixes. We develop interest in word-study and cultivate the use of the dictionary.

The study of these foreign elements in English leads to the study of the early history of Britain and correlates with geography. The pupils see how the coming of the Romans, the Anglo-Saxons, the Danes, and the Normans affected the language. We then study the Germanic and Romanic elements in everyday English. By the use of German and French cognates we arouse an interest in these languages, and by Latin derivations we show the value of a knowledge of Latin as the source of about 60 per cent of the English language.

The pupils learn to count to 100 in French, German, and Latin. They learn songs in French and Latin, mottoes, proverbs, etc. They watch the papers for the daily use of foreign elements and keep lists of these.

By this word-study the pupils become aware of the power of words. The grammatical structure of sentences begins to have real meaning for them. We study the different ways of expressing the same thought.

When the pupil has finished this course, he has a realization of the importance of language as such and has discovered whether he can profit by a study of the foreign languages. The teacher is able to judge somewhat of the pupil's language sense, and thus the course serves as a prognosis of language ability before the pupil begins the intensive study of any foreign language.

Modern language courses in some junior high schools are offered at different times for two groups of pupils: first, those whose ability warrants the election of an additional course in the seventh year; second, those who must defer to the ninth year the beginning of a modern language. In the latter case the need of all pupils for a preparatory semester or year in a background course should not be denied.

Other junior high schools prefer to restrict modern language electives to the eighth and ninth years and provide a year preparatory course and a year course of the usual first-year high-school work. This second program for modern languages is the logical approach in the development of modern languages in the junior high school program of studies. When precautions against the disintegrating influence of the former plan are actually operative and when it is determined that modern language courses in the seventh year are actually elective and not alternative to the general constants so essential to the fundamental purposes of the junior high school, the needs of the comparatively small group of exceptional children in the seventh year should be met by offering additional elective courses in modern languages.

MUSIC

Eight of the fourteen centers offer music electives in the fifth and sixth years. Music and social studies are the only subjects of the curriculum in which electives are offered in the fifth and sixth years of the elementary school. The fact that music electives are offered in the fifth and sixth years in a majority of the fourteen school systems is indicative of a tendency to follow in the school a custom which has always prevailed in the home, namely, the early introduction of musical training. Of the thirty-two courses offered by the eight centers, all are for a full year, twenty-five of them for one period a week and seven for two periods a week.

It is not shown in the reports whether the prevailing practice is to give the work during school hours or after school hours. As a rule, the work is undoubtedly after school in small groups of children from two or more grades. The courses offered are instrumental with the exception of the work in chorus. Probably, also, the expense involved in the purchase of instruments or in music lessons restricts the electives to those elementary-school pupils who can afford them. If restrictions were not unavoidable, the work would naturally become part of the required course in music.

Manifestly, the time has not yet come in many school systems when the board of education can either purchase musical instruments or give free instrumental music lessons; yet this practice, in one respect or the other, prevails in some centers. The situation as revealed in Table XXII shows very clearly the great expansion of the music courses of study, even in the elementary school, from exclusive voice training and singing to instrumental work, orchestra, band, etc. The socializing influence of this expansion both on the school itself and on the community is too patent to need more than passing mention. Truly the curriculum is undergoing revolutionary reconstruction.

In the junior high school years the expansion of the music course is still greater. Thirteen of the fourteen centers offer music electives in the seventh year. Ten of the eleven centers which have an eighth year give electives in the eighth year. Eleven of the fourteen centers offer courses in the ninth year. These figures plainly show the current trend toward a wider development of music courses in the junior high school. The same general restriction of time to a limited number of periods a week as was seen in the case of the elementary school is followed in the junior high school. The table shows that all electives are full-year courses with the exception of two quarter-year courses.

In the seventh year, of twenty-nine electives, twelve are for one period a week; one, for one and one-half periods a week; and eight, for two periods a week. Three vary from two and one-half to four periods a week. Five electives provide for five periods a week—the same as major electives in other subjects.

In the eighth year, of twenty-four courses, eleven are for one period a week; five are for two periods a week; one is for three periods; one is for four periods; and six courses provide for five periods a week.

In the ninth year, of thirty-five electives, ten are for one period a week, and fourteen are for two periods a week; seven vary from two and one-half to four periods, and four provide for five periods a week.

Of the total of eighty-eight electives listed by the fourteen centers in the seventh, eighth, and ninth years, sixty-one, or 69 per cent, have a time allotment restricted to one or two periods a week.

It is clear, therefore, that the general practice is to offer music electives in all three of the junior high school years and to limit the work to one or two periods a week. The limiting of the work to one or two periods a week suggests the possibility of making music electives part of a junior high school club organization—a practice which now prevails to some extent in several of the centers. Doubtless, the time given to music in the regular time schedule should be reserved for the required course in the core curriculum. Club time serves to enrich the curriculum, and naturally in the front rank of club electives are the courses in art and music.

The fact that fifteen, or 17 per cent, of the eighty-eight music electives are full-year courses of five periods a week reveals a tendency to add a fine arts curriculum to the program of studies. When the time allotted to fine arts electives equals the time allotted to other subject electives, the aptitudes of pupils for the fine arts will receive the recognition due to all native endowments. The equalization of educational opportunities will thus become an accomplished fact.

An examination of the types of courses offered in Grades 5 to 9 shows that instrumental types are given sixteen times in the list of electives, voice training or chorus types eight times, and appreciation types nine times. The number of instrumental courses almost equals the number of the other two types combined and naturally so because it is the instrumental type of course which has in recent years been so widely adopted. The other types of courses have existed for a comparatively much longer time.

Summarizing, 69 per cent of the junior high school electives in music are limited in time allotments to one or two periods. Of a total of sixty-one short courses, thirty-four are for one period a week, and twenty-seven are for two periods. Practice varies in assigning these courses to the regular time schedule or to the club period. The latter practice offers the easier administrative solution of short music electives.

The music electives to which are assigned time allotments equal to the time allotments of other major electives are 17 per cent of all of the junior high school music electives listed. This practice is evidence that a fine arts curriculum has found a place in the junior high school program of studies and also, to a less degree, that major electives in music are being made additional enrichment courses for pupils in other curriculums whose achievement records in the core curriculum and other electives justify the taking of extra work. Such enrichment courses, which extend the opportunities of short music electives in club organizations, should be carefully administered for the purpose of safeguarding other major interests. For this reason electives in music which call for five periods a week and which are supplementary to other curriculums should be restricted to the small group of junior high school pupils capable of carrying heavy schedules.

Music electives are, therefore, entering the program of studies as club activities, as major electives in a fine arts curriculum, and as electives supplementary to other major electives or as additional enrichment courses for pupils who can carry extra work. The important socializing effect of the expansion of music courses, both required and elective, should be recalled in an evaluation of the development.

Science

Berkeley alone offers a full-year elective of general science in the seventh year. The electives offered by Okmulgee, elementary natural science for nine weeks in the seventh year and elementary physical science for a half-year in the eighth year, are finding and broadening or try-out courses. This limited practice of offering science electives in the seventh and eighth years is to be expected. An elective in these years might be justified on the basis of an additional course for supernormal pupils or on the basis of try-out courses, as Okmulgee administers the seventh- and eighth-year curriculums.

Table XIX reveals a tendency to make introductory courses in science in the seventh and eighth years part of the core curriculum required of all pupils for the exploration of aptitudes for science, for the revelation of the ability to pursue higher courses in science, and for the interpretation of the science environment of early adolescent life in the junior high school.

On the other hand, eight of the fourteen centers offer science electives in the ninth year. This more extended practice is also to be expected, inasmuch as it has been the traditional practice to offer science electives in the first year of the high school. The progressive development of a science course for the three years of the junior high school to be required of all pupils was discussed in connection with Table XIX.

The present practice, however, of science electives in the ninth year will possibly persist so long as college-entrance requirements demand sixteen units for four years of high-school work instead of twelve units for the three years of the senior high school. In other words, the hope of a continuous and progressive course of study in science for the three years of the junior high school lies in reducing college-accrediting relations from four to three years. Yet, in spite of present accrediting requirements, three centers have made general science a required subject in the ninth year.

Seven of the eight centers which have science electives in the ninth year offer general science. Decatur offers an elective in general biology. St. Louis alone offers three electives—full-year courses in general science, botany, and physiology. The evidence is clear that general science has become the generally accepted science course of the junior high school. This course adapts itself far more effectively to the fundamental objectives of the junior high school than more specialized types of science courses. The inference is warranted, therefore, that general science has won a permanent place in the junior high school program of studies. Attention is called to the discussion in the preceding chapter where the reader will find a more general review of the present trend in the development of the science course of study in the junior high school.

Science electives may be warranted in the seventh and eighth years for two purposes: first, to provide additional courses for the small group of pupils who, by reason of high intelligence quotients and ability to maintain high achievement records, are able to carry enrichment courses; second, to provide science electives as try-out courses in the first two years of the junior high school. The more general practice, however, is to make science part of the core curriculum in the seventh and eighth years.

Science electives in the ninth year are an inheritance of traditional practice in the administration of the ninth-year curriculum and a present largely unavoidable concession to college-accrediting relations covering four years of secondary-school work. The more desirable practice, which is not general but which has been initiated in a few centers, is to continue science into the ninth year as part of the core curriculum.

Two conditions which now generally prevail will require remedy before science finds its proper place in the junior high school program of studies. First, there is general uncertainty as to materials and methods in the problem of adapting general science to the seventh and eighth years. Some experimentation, however, has already been made in developing introductory courses in science for the seventh and eighth years, and some textbooks have been partly adapted to courses more elementary than the usual ninth-year general science. More constructive progress both in introductory courses and in suitable textbooks must be made before science becomes generally practicable in the seventh and eighth years. The hope of the situation lies in the fact that real constructive progress is steadily being made. Second, the present college-accrediting relations must be reduced from four to three years before general science in the ninth year can be made a required and culminating unit of a progressive three-year course in the junior high school program of studies.

SOCIAL STUDIES

Kansas City explains its electives in social studies in the fifth and sixth grades by the following statement: "Work in citizenship is done in a Junior Citizens' Club formed in each room. Safety work is done largely through room representatives in a School Safety Council which co-operates with a city organization." Okmulgee's elective in the sixth year is part of its finding and broadening courses. The limited practice of offering electives in social studies in the elementary school suggests the inference that unique local conditions are reflected in exceptional practices which have little significance for general application.

In the ninth year all centers except Atlanta, Detroit, Rochester, and St. Louis offer electives in social studies. There are eleven different types of electives offered in the other ten centers. Berkeley, Birmingham, Cleveland, Kansas City, Okmulgee, and Somerville offer one full-year or half-year elective each. Denver offers two half-year courses or the equivalent of one full-year elective. Pittsburgh offers three half-year electives or an option of two of the three for the year. Los Angeles offers two full-year optional electives. Decatur offers one full-year elective and an optional year of work composed of three part-year courses.

A comparison of Tables XIX and XXII shows that of the four cities which offer no electives, three give required courses. In other words, one city gives neither an elective nor a required course in the ninth year. Of the six cities which offer one ninth-year elective, three have a required course. Of the two cities which offer two full ninth-year optional electives, one has a required course.

In the case of anyone familiar with the widespread adoption of social studies courses in the junior high school program of studies and sympathetic with the involved problems of adapting social custom and practice to a course of study for pupils of junior high school age, the extreme variation in present curriculum practice should not occasion surprise or undue concern. Rather, the present varied practice should bring hope that out of widespread and varying experimentation will come ultimately a generally accepted solution of the problem.

General courses of study pass through two consecutive stages. First, there is a co-ordinate stage of previously isolated units of instruction which in the co-ordinate stage remain isolated in materials and time distribution but are taught by one teacher to the same classes. For example, general mathematics is largely divided into arithmetic, algebra, and intuitive geometry, all three making a co-ordinate general mathematics course taught by one teacher to the same class but each taught as an isolated unit in materials and time allotments. Second, there is a unified or fusion stage when the isolated units of the co-ordinate stage are gradually fused into one unified body of materials. There are also various stages of transition between the two extremes of co-ordinate and unified courses.

Social studies divided into courses in community civics, vocational civics, economic civics, political civics, current world history, etc., represent the co-ordinate stage of isolated units of instruction. General social science as given in some of the chapters of Part II of the Twenty-second Yearbook of the National Society for the Study of Education[1] represents the second stage. Formerly isolated but related courses of study are fused into one unified general social science course. However desirable the unified course may be, its practicability has yet to be determined.

In social studies both stages exist in the present administration of the curriculum. Table XXII reveals the present preponderance of the co-ordinate stage. Yet the reports of several cities mention experiments which are being conducted in general social science, that is, the unified stage of development. The co-ordinate stage is inevitable because each isolated unit of instruction—for example, community civics, vocational civics, economic civics, current world history, etc.—must first develop its own body of materials before its most valuable content can be selected for a unified social science course. In other words, the co-ordinate stage is desirable because it offers an opportunity to evaluate the materials of the isolated units of instruction before the more difficult task is undertaken of determining relative values in the selection of materials for a general social science course.

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[1] *The Social Studies in the Elementary and Secondary School.* Twenty-second Yearbook of the National Society for the Study of Education, Part II. Bloomington, Illinois: Public School Publishing Co., 1923.

It should occasion no surprise that new courses of study are offered as electives before they are adopted in the core curriculum. Electives offer a far greater range of experimentation than required units of instruction. The fact that even a few attempts are being made to fuse social studies courses into a general social science course is indicative of a tendency to pass from the inevitable stage of co-ordinate courses to the equally inevitable and consequent development of unified courses. Out of chaos comes order, but it is a long evolutionary process.

The investigation reveals the varying degrees of development of two consecutive stages in the evolution of new courses of study. It must remain for a more comprehensive investigation to undertake the readjustment of the present varied practices. Such an extension of the present investigation will hasten the rapid evolution from a virtually chaotic condition to greater stability and uniformity of practice. The burden of the educational shift from disciplinary to social values has fallen heavily on the social studies. Stability and balance once achieved in the social science field will react on the socializing tendencies evident in the whole program of studies.

Electives in social studies increase the opportunities for experimenting with varied types of social studies courses in the general experiment of evaluating the present isolated units of instruction. When the relative values of social science materials have been determined in the present co-ordinate stage of teaching social studies as related but isolated units, the practicability of a unified course in general social science may be more intelligently determined.

It is necessary to recognize the consecutive development of new and general courses of study from electives to constants, from isolated units of instruction to general co-ordinate courses, and from co-ordinate courses to unified courses of study. A failure to recognize these inevitable stages of the evolution of the curriculum may lead to a blind rejection of new courses of study. On the other hand, a sympathetic understanding of the evolution now in the process of development will lead to a willing acceptance of present conditions of varied practice as inevitable and desirable and will lead also to a voluntary and helpful contribution toward more stable and generally acceptable practice. That the latter attitude of mind prevails in the fourteen centers investigated has been demonstrated beyond controversy by the unanimous offer of co-operation in an involved and difficult task. That a similar state of mind prevails generally throughout the great majority of elementary and junior high schools in the country will be demonstrated with equal certainty by the same type of co-operative effort which will attend an extension of the investigation.

CHAPTER VI

SUBJECT DIVISIONS OF THE CONSTANTS

The preceding chapters have amply demonstrated the fact that the American schools are widely divergent in their administration of the school subjects. This chapter and the next will carry the study into the details of subject organization and will report facts which show how various school systems deal with the subdivisions of their courses. This chapter will take the first step of analysis and will report on the gross subdivisions of each of the subjects which appear in the curriculum as constants.

Four tables are included in this chapter, namely, Tables XXIII to XXVI. These tables deal with the constants of the various curriculums. A separate table is devoted to industrial arts because so many subdivisions are included in this subject that it could not well be co-ordinated with the subjects reported in Tables XXIII and XXIV. A separate table is devoted to penmanship because this subject differs in character from the other subjects.

The facts reported in this chapter and the next show that the differences in the curriculums of the schools are not merely quantitative differences. The qualitative definitions of the subjects taught differ no less than do the time allotments in different grades and in different schools.

The wide variation of practice in administering the subject divisions of the constants reveals in greater detail than do the facts in any preceding chapter the need of the type of curriculum reconstruction which was discussed in chapter ii and at later points in this report.

The following detailed comments are intended for the special teachers and supervisors.

ENGLISH

All of the fourteen centers include composition and literature and reading in the curriculum of each of the five years; they also include spelling in the fifth and sixth years. The allocation of grammar varies as to grades, and spelling is not given by all centers in the junior high school years.

Table XXIV shows that the average proportional distribution of the English time allotments of all centers for all grades is greater for literature and reading than for any other division of the subject. An

TABLE XXIII

Number of Minutes a Week Allotted to the Subject Divisions of the Constants

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
English:																	
Composition:																	
Grade 5	90	60	60	100	60	164	160	140	140	150	145	150	150	165	165	60	123.9
Grade 6	90	60	60	100	60	82	160	90	140	150	100	150	*	125	160	60	105.2
Grade 7	90	40	60	80	50	120	65	50	147	38	110	140	104	60	147	38	82.4
Grade 8	X†	40	X	70	50	80‡	50	X	147	38	105	140	104	60	147	38	80.4
Grade 9	55	40	87	25	100	87‡	50	119	174	38	125	120	104	120	174	25	88.9
Grammar:																	
Grade 5	60	140	60	75	15	.....	.....	40	94	.....	25	.....	.....	.....	140	15	63.6
Grade 6	60	140	90	75	15	30	.....	135	94	.....	50	.....	160	40	160	15	80.8
Grade 7	60	40	90	135	120	100	75	140	105	38	50	75	52	.....	140	38	83.1
Grade 8	X	40	X	45	120	40‡	60	X	126	38	40	75	52	60	126	38	63.3
Grade 9	45	40	63	45	.....	43‡	60	6	105	38	20	60	52	60	105	6	49.0
Literature and reading:																	
Grade 5	150	175	150	200	75	164	240	180	136	200	200	150	150	180	240	75	167.9
Grade 6	150	175	150	225	75	164	240	120	136	200	220	150	120	180	240	75	164.6
Grade 7	150	90	175	112	100	100	150	§	105	183	115	75	104	60	183	60	116.8
Grade 8	X	90	X	90	100	80	120	X	126	183	75	75	104	60	183	60	100.3
Grade 9	100	90	75	135	150	100	120	125	105	183	130	120	104	120	183	75	118.4
Spelling:																	
Grade 5	75	100	75	100	75	95	100	100	55	125	100	75	75	75	125	55	87.5
Grade 6	75	100	75	75	75	90	100	100	55	50	75	75	75	75	100	50	78.2

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* Part of the time allotted to grammar in the sixth grade in St. Louis is apportioned to composition; since no suggestion of the basis of the apportionment is made in the report, the time is given under grammar as it is reported.

† X means that the school system is organized on the 7-4 plan and does not include an eighth grade.

‡ Denver reports 120 and 130 minutes a week respectively in the eighth and ninth years allotted to composition and grammar combined. The time has been apportioned in this table on the basis of two-thirds to composition and one-third to grammar.

§ Kansas City adds the following note: "About one-third of the pupils in the seventh grade are enrolled in an 'Extra English' class which meets five times a week with class periods of 50 minutes each. Silent reading is stressed in these classes. The work includes literature, appreciation, memorizing of poems, dramatization, and oral and written English. The course is elective in that it is chosen under guidance."

TABLE XXIII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
English: Spelling—*Continued*																	
Grade 7	75	30	75	20	50	25	10	60	36	16	.....	10	.....	60	75	10	38.9
Grade 8	X	30	X	20	50	50	10	X	36	16	.....	10	.....	60	60	10	31.3
Grade 9	.....	30	.....	20	50	20	10	.....	36	16	.....	.....	.....	.....	50	10	26.0
Health:																	
Hygiene:																	
Grade 5	50	86	75	80	100	30	50	50	25	100	80	25	.....	60	100	25	62.4
Grade 6	50	86	.....	80	100	30	50	50	25	30	80	25	.....	30	100	25	53.0
Grade 7	50	85	.....	45	100	10	60	25	20	55	.....	5	30	60	100	5	45.4
Grade 8	X	85	X	45	52	10	60	X	20	55	.....	5	15	60	85	5	40.7
Grade 9	.....	85	.....	.....	.....	10	60	63	20	55	.....	5	30	.....	85	5	41.0
Physical education:																	
Grade 5	75	64	75	60	75	100	240	110	100	150	200	120	60	200	240	60	116.4
Grade 6	75	64	75	60	75	100	210	110	100	150	200	120	60	200	210	60	114.2
Grade 7	75	115	75	90	50	90	240	100	180	220	120	55	74	75	240	50	111.4
Grade 8	X	115	X	90	50	90	240	X	180	220	120	55	37	75	240	37	115.6
Grade 9	40	115	.....	90	.....	90	240	187	180	220	120	55	74	75	240	40	123.8
Home economics:																	
Clothing:																	
Grade 5	.....	90	24*	.....	.....	39	75	42	75	.....	.....	120	.....	60	120	24	65.6
Grade 6	.....	45	.....	.....	.....	52	105	83	38	.....	.....	50	.....	60	105	38	61.9
Grade 7	.....	.....	.....	90	100	130	150	.....	100	.....	80	135	208	60	208	60	117.0
Grade 8	X	100	X	90	.....	65	60	X	80	.....	.....	90	.....	60	100	60	77.9
Grade 9	.....	.....	.....	.....	.....	.....	60	.....	.....	184	.....	90	.....	.....	184	60	111.3
Foods:																	
Grade 5	.....	.....	24*	.....	.....	20	.....	41	.....	.....	.....	.....	.....	.....	41	20	28.3
Grade 6	.....	45	48	.....	.....	19	.....	82	33	.....	.....	50	.....	.....	82	19	46.2
Grade 7	.....	100	48	90	.....	130	75	.....	90	.....	80	45	52	40	130	40	75.0
Grade 8	X	.....	X	90	100	65	30	X	75	.....	.....	90	52	40	100	30	67.8
Grade 9	.....	.....	.....	.....	.....	.....	30	.....	.....	183	.....	45	.....	.....	183	30	86.0

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* The unapportioned time allotment of 60 minutes a week reported by Birmingham for home economics has been divided by giving two-fifths of the time to clothing, two-fifths to foods, and one-fifth to home and family.

TABLE XXIII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Home economics—*Continued*																	
Home and family:																	
Grade 5	....	....	12*	....	....	16	....	....	....	....	....	30	....	....	30	12	19.3
Grade 6	....	....	12	....	....	19	....	....	4	....	....	50	....	....	50	4	21.3
Grade 7	....	....	12	....	....	....	75	....	10	....	60	....	....	20	75	10	35.4
Grade 8	X	....	X	....	....	....	30	X	45	....	....	....	....	20	45	20	31.7
Grade 9	....	....	....	....	....	....	30	....	....	183	....	45	....	....	183	30	86.0
Mathematics:																	
Algebra:																	
Grade 7	....	....	82	....	....	....	23	....	....	....	....	....	....	....	82	23	52.5
Grade 8	X	....	X	....	....	125	78	X	100	....	69	150	104	....	150	69	104.3
Grade 9	200	....	225	225	250	125	240	....	100	....	206	300	....	285	300	100	215.6
Arithmetic:																	
Grade 5	150	200	300	225	125	205	250	250	175	175	150	250	150	250	300	125	203.9
Grade 6	150	200	275	225	125	205	250	250	175	175	150	250	120	250	275	120	200.0
Grade 7	150	200	193	225	250	125	208	250	100	275	234	150	149	180	275	100	192.1
Grade 8	X	200	X	120	250	125	154	X	....	275	117	75	156	180	275	75	165.2
Grade 9	200	....	225	....	....	....	....	....	100	....	....	....	....	....	225	100	175.0
Geometry:																	
Grade 7	....	....	....	....	....	125	9	....	100	....	41	150	115	....	150	9	90.0
Grade 8	X	....	X	105	....	....	8	X	100	....	89	75	....	....	105	8	75.4
Grade 9	....	....	....	....	....	125	60	....	....	....	69	....	....	....	125	60	84.7
Science:																	
Agriculture:																	
Grade 5	....	....	....	....	....	....	....	....	30	....	....	....	....	....	....	....	....
Grade 6	....	....	....	....	....	....	....	....	30	....	....	....	....	....	....	....	....
Gardening:																	
Grade 5	30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grade 6	30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grade 7	30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

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* The unapportioned time allotment of 60 minutes a week reported by Birmingham for home economics has been divided by giving two-fifths of the time to clothing, two-fifths to foods, and one-fifth to home and family.

TABLE XXIII—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Science—*Continued*																	
General science:																	
Grade 6	....	....	150	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grade 7	....	200	....	....	....	....	120	....	....	....	....	120	130	....	200	120	142.5
Grade 8	X	200	X	....	250	....	120	X	....	....	120	120	260	....	260	120	178.3
Grade 9	....	....	225	....	....	....	120	....	....	....	....	240	....	....	240	120	195.0
Nature study:																	
Grade 5	60	30	....	....	....	20	....	....	60	100	120	....	....	30	120	20	60.0
Grade 6	60	30	....	....	....	21	....	....	60	100	120	....	30	30	120	21	56.4
Grade 7	60	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Social studies:																	
Ancient, medieval, and early modern history:																	
Grade 9	....	....	....	....	....	....	300	....	....	....	....	....	....	....	....	....	....
Community civics:																	
Grade 5	....	50	50	....	....	....	....	....	....	....	15	....	35	30	50	15	36.0
Grade 6	25	50	75	....	....	....	....	....	....	....	15	....	35	30	75	15	38.3
Grade 7	....	....	88	36	....	....	....	....	....	250*	22	120	....	....	250	22	103.2
Grade 8	X	....	X	45	125	....	165	X	....	....	187	96	....	....	187	45	123.6
Grade 9	....	200	....	....	....	....	....	....	210	....	....	60	130	60	210	60	132.0
Economic civics:																	
Grade 6	25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grade 8	X	....	X	....	....	....	45	X	....	....	....	....	....	....	....	....	....
United States history:																	
Grade 5	....	100	75	125	150	....	250	....	....	150	75	50	40	30	250	30	104.5
Grade 6	150	125	150	125	150	....	250	....	....	150	125	50	40	30	250	30	122.3
Grade 7	250	200	187	144	250	200	300	250	210	....	198	180	260	180	300	144	216.1
Grade 8	X	200	X	135	125	200	....	X	....	250	33	144	260	180	260	33	169.7
Grade 9	....	....	....	....	....	....	....	....	....	....	....	60	....	....	....	....	....
Vocational civics:																	
Grade 6	25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grade 7	....	....	....	....	....	50	....	....	....	55	....	....	....	....	55	50	52.5
Grade 8	X	....	X	45	....	50	....	X	294	55	....	....	....	....	294	45	111.0
Grade 9	....	....	....	....	....	....	....	....	....	55	....	....	130	....	130	55	92.5

* Includes economic civics.

TABLE XXIV

PROPORTIONAL DISTRIBUTION OF THE TIME ALLOTMENTS TO THE SUBJECT DIVISIONS OF THE CONSTANTS

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.*
English:																	
Composition:																	
Grade 5	24	13	17	21	27	39	32	30	33	32	31	40	40	39	40	13	29.8
Grade 6	24	13	16	21	27	22	32	20	33	38	23	40	....	30	40	13	24.2
Grade 7	24	20	15	23	16	32	22	20	37	14	40	47	40	33	47	14	27.3
Grade 8	X†	20	X	31	16	32	21	X	34	14	48	47	40	25	48	14	29.8
Grade 9	27	20	39	11	33	35	21	48	41	14	46	40	40	40	48	11	33.4
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	28.5
Grammar:																	
Grade 5	16	29	17	16	7	....	....	9	22	....	5	....	....	....	29	5	8.7
Grade 6	16	29	24	16	7	8	....	30	22	....	11	....	45	9	45	7	15.7
Grade 7	16	20	22	39	37	27	25	56	27	14	18	25	20	....	56	14	25.6
Grade 8	X	20	X	20	37	16	25	X	29	14	18	25	20	25	37	14	23.5
Grade 9	23	20	28	20	....	17	25	2	25	14	7	20	20	20	28	2	17.1
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17.1
Literature and reading:																	
Grade 5	40	37	44	42	33	39	48	39	32	42	43	40	40	43	48	32	40.4
Grade 6	40	37	40	47	33	45	48	27	32	50	49	40	34	43	50	27	40.7
Grade 7	40	45	44	32	31	27	50	....	27	66	42	25	40	33	66	25	36.0
Grade 8	X	45	X	40	31	32	50	X	29	66	34	25	40	25	66	25	37.2
Grade 9	50	45	33	60	50	40	50	50	25	66	47	40	40	40	66	25	44.6
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	39.9

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* These percentages were obtained as follows: (1) In the case of English, for example, there was secured the sum total of the time allotments of all centers to each division of the subject in each grade; in the fifth grade the sum total of the time allotments of fourteen centers to composition is 1,734 minutes; the sum total of the time allotments of eight centers to grammar is 509 minutes; the sum total of the time allotments of fourteen centers to literature and reading is 2,350 minutes; and the sum total of the time allotments of fourteen centers to spelling is 1,225 minutes. (2) The sum totals were added to obtain the grand total of the time allotments of all centers to all divisions of English in each grade; in the fifth grade the grand total of the time allotments to all divisions of English is 5,818 minutes. (3) The percentages are the ratio of the sum total for each division of English to the grand total for all divisions of English in each grade. Thus a fairly dependable average proportional distribution of the English time allotments of all centers to the divisions of English in each grade is obtained; in the fifth grade the average proportional distribution of the English time allotments of all centers to composition is the ratio of 1,734 minutes, the sum total time allotment to composition, to 5,818 minutes, the grand total time allotment to all divisions of English, or 29.8 per cent.

† X means that the school system is organized on the 7-4 plan and does not include an eighth grade.

TABLE XXIV—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
English—*Continued*																	
Spelling:																	
Grade 5	20	21	22	21	33	22	20	22	13	26	21	20	20	18	33	13	21.1
Grade 6	20	21	20	16	33	25	20	23	13	12	17	20	21	18	33	12	19.4
Grade 7	20	15	19	6	16	6	3	24	9	6	....	3	....	34	34	3	11.1
Grade 8	X	15	X	9	16	20	4	X	8	6	....	3	....	25	25	3	9.5
Grade 9	....	15	....	9	17	8	4	....	9	6	....	....	....	....	17	4	4.9
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14.5
Health:																	
Hygiene:																	
Grade 5	40	57	50	57	57	23	17	31	20	40	29	17	....	23	57	17	33.2
Grade 6	40	57	....	57	57	23	19	31	20	17	29	17	....	13	57	13	28.5
Grade 7	40	43	....	33	67	10	20	20	10	20	....	8	29	44	67	8	25.9
Grade 8	X	43	X	33	51	10	20	X	10	20	....	8	29	44	51	8	24.2
Grade 9	....	43	....	....	....	10	20	25	10	20	....	8	29	....	43	8	18.1
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	26.5
Physical education:																	
Grade 5	60	43	50	43	43	77	83	69	80	60	71	83	100	77	100	43	66.8
Grade 6	60	43	100	43	43	77	81	69	80	83	71	83	100	87	100	43	71.5
Grade 7	60	57	100	67	33	90	80	80	90	80	100	92	71	56	100	33	74.1
Grade 8	X	57	X	67	49	90	80	X	90	80	100	92	71	56	100	49	75.8
Grade 9	100	57	....	100	....	90	80	75	90	80	100	92	71	100	100	57	81.9
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	73.5
Home economics:																	
Clothing:																	
Grade 5	....	100	40	....	....	52	100	51	100	....	....	80	....	100	100	40	78.6
Grade 6	....	50	....	....	....	58	100	50	51	....	....	34	....	100	100	34	54.5
Grade 7	....	....	....	50	100	50	50	....	50	....	37	75	80	50	100	37	53.2
Grade 8	X	100	X	50	....	50	50	X	40	....	....	50	....	50	100	40	46.1
Grade 9	....	....	....	....	....	....	50	....	....	34	....	50	....	....	50	34	39.3
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	52.8

TABLE XXIV—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Home economics—*Continued*																	
Foods:																	
Grade 5			40			27		49							49	27	12.7
Grade 6		50	80			21		50	44			33			80	21	34.8
Grade 7		100	80	50		50	25		45		36	25	20	33	100	20	37.9
Grade 8	X		X	50	100	50	25	X	38			50	100	33	100	25	45.9
Grade 9							25			33		25			33	25	30.4
All grades																	34.9
Home and family:																	
Grade 5			20			21						20			21	20	8.7
Grade 6			20			21			5			33			33	5	10.7
Grade 7			20				25		5		27			17	27	5	8.9
Grade 8	X		X				25	X	22					17	25	17	8.0
Grade 9							25			33		25			33	25	30.3
All grades																	12.3
Mathematics:																	
Algebra:																	
Grade 7			30				9								30	9	3.1
Grade 8	X		X			50	33	X	50		25	50	40		50	25	23.6
Grade 9	50		50	100	100	50	80		50		75	100		100	100	50	73.5
All grades																	19.8
Arithmetic:																	
Grade 5	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100.0
Grade 6	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100.0
Grade 7	100	100	70	100	100	50	87	100	50	100	85	50	56	100	100	50	80.7
Grade 8	X	100	X	54	100	50	64	X		100	43	25	60	100	100	25	61.6
Grade 9	50		50						50						50	50	17.9
All grades																	72.1
Geometry:																	
Grade 7						50	4		50		15	50	44		50	4	16.2
Grade 8	X		X	46			3	X	50		32	25			50	3	14.8
Grade 9						50	20				25				50	20	8.6
All grades																	8.1

TABLE XXIV—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Science:																	
Agriculture:																	
Grade 5	....	....	....	....	....	....	....	....	33	....	....	....	....	....	....	....	6.2
Grade 6	....	....	....	....	....	....	....	....	33	....	....	....	....	....	....	....	4.6
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.7
Gardening:																	
Grade 5	33	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6.3
Grade 6	33	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4.5
Grade 7	33	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4.5
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.6
General science:																	
Grade 6	....	....	100	....	....	....	....	....	....	....	....	....	....	....	....	....	22.7
Grade 7	....	100	....	....	....	....	100	....	....	....	....	100	100	....	100	100	86.4
Grade 8	X	100	X	....	100	....	100	X	....	....	100	100	100	....	100	100	100.0
Grade 9	....	....	100	....	....	....	100	....	....	....	....	100	....	....	100	100	100.0
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	68.7
Nature study:																	
Grade 5	67	100	....	....	....	100	....	....	67	100	100	....	....	100	100	67	87.5
Grade 6	67	100	....	....	....	100	....	....	67	100	100	....	100	100	100	67	68.2
Grade 7	67	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9.1
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	27.0
Social studies:																	
Ancient, medieval, and early modern history:																	
Grade 9	....	....	....	....	....	....	100	....	....	....	....	....	....	....	....	....	24.9
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3.0
Community civics:																	
Grade 5	....	33	40	....	....	....	....	....	....	....	17	....	47	50	50	17	14.7
Grade 6	11	29	33	....	....	....	....	....	....	....	11	....	47	50	50	11	14.2
Grade 7	....	....	32	20	....	....	....	....	....	82	10	40	....	....	82	10	15.0
Grade 8	X	....	X	20	50	....	79	X	....	....	85	40	....	....	85	20	23.5
Grade 9	....	100	....	....	....	....	....	....	100	....	....	50	50	100	100	50	54.8
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	21.8

TABLE XXIV—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.	High	Low	Av.
Social studies—*Continued*																	
Economic civics:																	
Grade 6	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.5
Grade 8	X	....	X	....	....	....	21	X	....	....	....	....	....	....	....	....	1.7
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.7
United States history:																	
Grade 5	....	67	60	100	100	....	100	....	....	100	83	100	53	50	100	50	85.3
Grade 6	67	71	67	100	100	....	100	....	....	100	89	100	53	50	100	50	82.8
Grade 7	100	100	68	80	100	80	100	100	100	....	90	60	100	100	100	60	81.9
Grade 8	X	100	X	60	50	80	....	X	....	82	15	60	100	100	100	15	58.0
Grade 9	....	....	....	....	....	....	....	....	....	....	....	50	....	....	....	....	5.0
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	67.0
Vocational civics:																	
Grade 6	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.5
Grade 7	....	....	....	....	....	20	....	....	....	18	....	....	....	....	20	18	3.1
Grade 8	X	....	X	20	....	20	....	X	100	18	....	....	....	....	100	18	16.8
Grade 9	....	....	....	....	....	....	....	....	....	100	....	....	50	....	100	50	15.3
All grades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7.5

average for all grades of almost two-fifths of the English time is allotted to literature and reading. Composition ranks second in the average proportional allotment of the English time for all grades; grammar is third and spelling fourth. The general practice, therefore, in the administration of the English course of study indicates a tendency to stress the cultural and the social values of literature appreciation and facility in the use of oral and written expression. The strictly disciplinary values of grammar have lost their predominating influence in the organization of English courses of study for the intermediate grades where for so many years grammar prevailed as the major unit of instruction. That this change in practice has not become general, however, is evident from the variation in practice shown in Tables XXIII and XXIV.

The shift from disciplinary to social values is progressing, but it has not been completely effected. The conflict of judgment as to fundamental values and objectives still persists in causing confusion in curriculum-making and wide variation in curriculum administration. Certainly it is clear that much is yet to be done in adjusting conflicting points of view. Encouragement can be found, however, in the evaluation which the fourteen centers in their administration of the curriculum give to the four major divisions of the English course of study. The evaluation as determined by the average proportional distribution of time allotments is 40 per cent of the English time to literature and reading, 28 per cent to composition, 17 per cent to grammar, and 15 per cent to spelling.

In the case of literature and reading the average proportional time allotment is practically the same for the fifth and sixth years. There is a decrease in the seventh year. This is doubtless due to the greater proportion of time allotted to grammar in the seventh year. The proportion rises slightly in the eighth year and considerably in the ninth year. The increase in the ninth year is consistent with the high-school practice of emphasizing literature in the English course of study. The articulation of elementary and secondary courses of study in English, therefore, is influenced by the former practice in the upper grammar grades of emphasizing formal grammar and by the former high-school practice in the ninth year of emphasizing literature. Table XXIII shows wide variation among the fourteen centers in time allotments to literature and reading in all grades—nearly three hours a week in the fifth and sixth years and approximately two hours a week in each of the junior high school years. On the percentage basis, however, the extent of variation is greater in the junior high school.

A more equitable distribution of time to the four divisions of English in the junior high school and less concentration or intensive work on a particular division of the subject in any one grade will promote a better articulated course of study and a more progressive and consistent development in each division of English. There will also be conserved the indisputable right of pupils leaving school in the junior high school period to training in literature appreciation and in the formation of reading habits. Consequently, literature appreciation must not be made a deferred value only for those who continue in the senior high school. As a matter of fact, the normal curve of reading reaches its highest point at thirteen or fourteen years of age. Therefore, both the present tendency to increase the proportional allotment of English time to literature in the seventh and eighth years and the provision for extensive reading in the junior high school library should be encouraged.

A readjustment of the former practice of concentrating grammar in the seventh and eighth years should be sought by shifting from formal and disciplinary grammar to functional grammar. When the latter aim in grammar teaching is once accepted, there must be adopted at the same time a plan to distribute grammar work among the junior high school grades and the upper elementary grades in order that grammar may actually be made continuously and progressively functional. With this development in grammar work will come a more equitable time distribution to literature and to oral and written composition.

Table XXIV reveals the fact that in the average practice of the fourteen centers composition is ranked second in importance in each of the five years. This is emphatically true in the fifth and ninth years where the average proportional time allotment to composition is much larger in comparison with grammar. There is a close approximation of average time allotments to composition and grammar in the sixth, seventh, and eighth years. The tendency to increase time allotments to composition in comparison with grammar in the sixth, seventh, and eighth years is evident from the following: Ten centers give more time to composition than to grammar in the sixth year, leaving only four centers which give more time to grammar. In the seventh year, seven centers give more time to composition than to grammar; two centers give the same time to both, and five centers give more time to grammar than to composition. In the eighth year, six centers of the eleven which have an eighth year give more time to composition than to grammar; three give the same time to both, and two give more time to grammar than to composition. The tendency is clear, but the variation in time allotments to composition shows that practice has not become uniform. New textbooks for the junior high school grades with their greater emphasis on composition are doing much, however, to stabilize practice, and the revision of former courses of study for these grades is doing even more.

In the case of grammar the smallest proportional time allotment, in the average practice of the fourteen cities, is in the fifth year and the largest in the seventh year, with greater proportional time in the eighth year than in the ninth year. The greatest variation is in the seventh year, and there is an excessive amount of variation in the sixth year. Grammar is clearly becoming adjusted in the curriculum; it is becoming rationalized as a means to an end, namely, the interpretation of correct use. It is gradually becoming less of an end in itself and is properly becoming subordinated in importance to composition and literature. Both the present evident tendencies and the excessive variations in practice as revealed in Tables XXIII and XXIV point conclusively to widespread experiments in the reconstruction of the English course of study.

The time allotments to spelling reflect a practice which is probably general in all school systems. All of the fourteen centers include spelling in the English course of the fifth and sixth years; twelve of the fourteen centers continue it in the seventh year. Nine of the eleven centers which have an eighth year require spelling in the eighth year. Seven centers require spelling in the ninth year. Half of the fourteen centers include spelling in all three years of the junior high school. At the same time there is a gradually decreasing time allotment from 21.1 per cent in the fifth year to 4.9 per cent in the ninth year. Astonishing variation in practice appears in each year of the junior high school—from 34 per cent to 3 per cent in the seventh year, from 25 per cent to 3 per cent in the eighth year, and from 17 per cent to 4 per cent in the ninth year. On the other hand, the percentage of variation is somewhat less in the upper grades of the elementary school—from 33 per cent to 13 per cent in the fifth year and from 33 per cent to 12 per cent in the sixth year. Long established practice has stabilized curriculum administration in the elementary grades, while the reconstruction of the curriculum in the junior high school is too recent to warrant even an expectation of uniformity of practice.

A majority of the centers continue spelling from the elementary school into the junior high school, but it is not yet determined to what extent spelling as a distinct division of English shall be made part of the junior high school program of studies. The average proportional distribution in the seventh and eighth years is about 10 per cent of the English time, while in the ninth year it is reduced by more than one-half. Apparently the elementary-school practice of making spelling a distinct part of the curriculum will cease somewhere in the junior high school, probably in the seventh or eighth year.

Two practices, both of which appear in several of the fourteen centers, will contribute to the solution of the problem of spelling in the junior high school. First, the actual need of pupils for spelling is being definitely determined by means of achievement tests and standardized spelling lists. Second, spelling is being effectively correlated with other English work and, in some cases, with other subjects. The first method of solving the problem avoids useless waste of time in the case of those who do not need further formal study of spelling. It also promotes the determination of the words which are causing difficulty for each pupil who needs to continue the formal study of spelling. On the other hand, correlation promotes the actual functional use of spelling. The latter is an ideal practice, but it seldom continues long in operation. The surer method is the achievement test and the standardized lists. After those pupils are selected whose needs warrant the giving of more time to spelling, some type of spelling tablet should be employed which focuses the attention of both pupils and teacher on the misspelled words. This should be followed, if necessary, by the spelling text. Thus the initial step in the solution of the spelling problem in the junior high school can be made the spelling achievement test plus administrative courage to disregard traditional practice and to rely wholly on the actual determination of the real needs of the pupils.

Summary.—A fundamental change is occurring in the administration of the English course of study which is due to the same condition that is causing similar changes in other courses of study, namely, the drift from disciplinary to social values in education. In English the effect is evident in the tendencies mentioned: first, to make literature and reading the major division of the English course of study; second, to increase the time allotment to oral and written composition; third and chiefly, to change grammar from an end in itself to a means to an end; and, fourth, to reduce the problem of spelling in the junior high school to a determination of the actual needs of junior high school pupils for spelling.

HEALTH

The types of health instruction given in the fourteen centers are hygiene and physical education. Hygiene is part of the health course of study in all but one of the centers in the fifth year and in all but two of the centers in the sixth and seventh years. One center—other than the 7-4 school systems—in the eighth year and six centers in the ninth year do not give instruction in hygiene. Hygiene is not, however, as generally adopted as a part of the health course as is physical education. There are only two grades in two centers in which physical education is not given, but there are twelve grades in seven centers in which hygiene is not given. Physical education, therefore, is a constant in the curriculums of all centers in both the elementary school and the junior high school. While hygiene appears as a constant in either the elementary-school curriculum or the junior high school curriculum of each center, practice varies in the continuity of the work.

The following are the average weekly time allotments to health instruction, that is, hygiene: fifth year, 62 minutes a week in thirteen of the fourteen centers; sixth year, 53 minutes a week in twelve of the fourteen centers; seventh year, 45 minutes a week in twelve of the fourteen centers; eighth year, 41 minutes a week in ten of the eleven centers; ninth year, 41 minutes a week in eight of the fourteen centers. On a daily average, these time allotments are: fifth year, 12 minutes; sixth year, 11 minutes; seventh year, 9 minutes; eighth year, 8 minutes; ninth year, 8 minutes. These time allotments are administered in one of two ways. Either a weekly period is set aside for health instruction by the physical education instructor, or the instruction is given incidentally in connection with physical education, gymnasium, or playground activities. The latter is the prevailing practice. Other variations in practice are included in the reports, but the two types of administration mentioned prevail in a large majority of the fourteen centers.

The course of study in hygiene is not as definitely organized as the course of study in physical education. Consequently, the responsibility of the physical instructors to give health instruction is not as carefully determined as their responsibility in the case of physical training. The large proportion of time allotted to hygiene in each grade, varying from 33.2 per cent in the fifth year to 18.1 per cent in the ninth year, or an average of 26.5 per cent for all grades, justifies more serious attention to the construction of a hygiene course of study than is manifest in the majority of the centers.

The problem of where health instruction shall be given is largely unsolved. This investigation shows that the instruction is distributed, as it probably should be, among three groups of teachers. First, social studies teachers are giving health instruction as part of their courses of study, covering such features as agencies engaged in promoting physical welfare—clinics, playgrounds, parks, and welfare organizations—

health as a public, home, and personal responsibility, etc. Second, science teachers are giving instruction in the physiology of the subject. Third, physical instructors are teaching personal hygiene. In practically all of the centers confusion is evident, due to lack of clear distinctions between the related features of health instruction as taught by the three groups of teachers and to the consequent overlapping of instruction and waste of instructional time and energy.

In centers where the initiative in securing articulation of the related features of health instruction has been taken by the supervisors of health education, conscious and purposeful efforts to articulate the instruction are being made. Inasmuch as health instruction is peculiarly a function of the health or physical education staff of a city school system, it would seem desirable to place the responsibility definitely on the health staff. Certainly it is true that of the related features of health instruction as distributed in general practice among social studies, science, and physical education, the most vital is the personal hygiene instruction or the functional phase. Social studies teachers give the instruction from the standpoint of social practice; science teachers approach the work from the scientific standpoint; but physical instructors teach it in its personal significance with a view to securing its proper functioning in the habits of each child.

When, therefore, through the initiative of the health director, articulation is secured with the social studies and the science departments and when the physical education instructors are made as responsible for the effective use of the average time allotment of 26 per cent to hygiene as they now are for the 74 per cent to physical education, then the present confusion will be largely removed. Furthermore, the almost desperate need of both preadolescent and early adolescent children for reliable instruction in matters of personal hygiene and for sympathetic guidance in the development of right habits of living and right habits of thinking of themselves and others—this and kindred needs of pupils will receive the attention which they have so long deserved.

Thus it appears that physical education—that is, gymnasium work, playground activities, directed games, and other organized and recreational work—has become fairly well organized on a generally accepted basis. It remains for the health department, first, to secure the direction and articulation of all health education activities; second, to place responsibility definitely on physical instructors for the organization of courses in personal hygiene; and, third, to secure the functioning of all health instruction in the personal lives of the pupils.

Summary.—Of the time allotted to health education in the fourteen centers, 26 per cent is devoted to hygiene and 74 per cent to physical education. Physical education has become stabilized. The variations in practice are due largely to differences of equipment in gymnasium facilities, playgrounds, etc. Hygiene has come into the course of study more recently and as a result of a recognized need for personal hygiene instruction. Responsibility for this work should be placed on physical instructors by making clearer distinctions between the social phases of health instruction as given by social studies teachers, the physiological phases as given by science teachers, and the functional phases as given by physical instructors.

When more definite courses in personal hygiene are developed, a different administration of the time allotment to hygiene may be desirable. The distribution of time allotments on the basis of 26 per cent for hygiene and 74 per cent for physical education suggests, in a time schedule of four periods a week for health education, three periods for physical training (gymnasium, playground, swimming pool, directed games, etc.) and one period for hygiene instruction. This administration of the time will facilitate the use of the comparatively expensive gymnasium equipment by larger numbers of pupils for more periods a week. The weekly period of hygiene instruction can be given in a typical classroom, thereby releasing the gymnasium or swimming pool for other classes. Furthermore, the setting aside of one period a week for health teaching by the physical instructor will result in fixing responsibility and lead to the construction of definite courses in hygiene.

HOME ECONOMICS

The divisions of home economics which are generally incorporated as separate units of instruction in the course of study are foods (cooking) and clothing (sewing). The home economics outline used in connection with this investigation included a third unit, namely, the home and the family. In no center, as is to be expected, is this unit taught as a separate branch with its own time allotment of whole periods. It is a part of the other two units. Thus the time allotments to this third division represent in all instances portions of the time allotments for foods and clothing. This situation will explain two facts which appear in Table XXIII: the limited number of centers reporting for the home and the family and the comparatively limited amount of time allotted to it. The absence of the time allotment in the case of any center is not to be interpreted to mean that the school system does not incorporate this unit in its course of study but rather that the work is so closely connected with the work in foods and clothing that distinctions of time distribution cannot be made. In the majority of the centers in which reports were made for this division of the subject the time allotment was estimated as a part of foods.

For the purpose of comparing cooking and sewing only in the administration of the course of study the proportional time allotments of the last two divisions of home economics as shown in Table XXIV may be combined. The table would then read as follows: Clothing (sewing): fifth year, 78.6 per cent; sixth year, 54.5 per cent; seventh year, 53.2 per cent; eighth year, 46.1 per cent; ninth year, 39.3 per cent. Foods (cooking): fifth year, 21.4 per cent; sixth year, 45.5 per cent; seventh year, 46.8 per cent; eighth year, 53.9 per cent; ninth year, 60.7 per cent.

The time allotments in the ninth year as reported by the three centers which require home economics in this year are approximately the same for the three divisions. In other words, as the course of study in home economics develops from a limited scope of cooking and sewing in the elementary school and the first years of the junior high school into a broader range of home training courses in the latter part of the junior high school, the course becomes more widely differentiated. Thus distinct units of instruction appear in the course of study which are closely allied with the unit "home and family"—for example, home nursing, care of convalescents, family budgets, home decoration, family marketing, etc. These units are of undoubted value in a home economics course. If general practice places them in the ninth year only on a basis comparable to foods and clothing, the advisability of a required ninth-year course is again apparent. The progressive development of a course in home economics is seriously hindered, therefore, when the course is restricted to the seventh and eighth years. The degree to which home economics courses are expanded beyond the range of cooking and sewing is likely to be far greater in the ninth year than in the two preceding years.

Girls of junior high school age should be assured of receiving the types of home training courses which are included under home and family and which evidently are well adapted to the more mature development of ninth-year pupils. Such units of instruction should not be elective; they deserve recognition in the core curriculum. The most direct way to obtain this recognition would seem to be to make them required units in the ninth-year curriculum. It will be noted that in the case of the three cities which require home economics in the ninth year the home and family unit receives a time allotment equal to that of foods and nearly equal to that of clothing.

Table XXIII shows that the average practice in the fourteen centers is to give far greater emphasis to clothing or sewing than to foods or cooking in the fifth and sixth years. The same practice prevails in the seventh, eighth, and ninth years. In the fifth year only three centers require foods, while clothing is given by eight centers. The three centers which give foods also give clothing. All centers, then, which have fifth-year home economics courses include clothing. Home economics courses in the elementary school are introduced, therefore, by elementary sewing in a majority of the fourteen centers. In the sixth year five centers give both foods and clothing; one gives foods only, and two give clothing only. In the seventh year eight centers give both courses; two give foods only, and one gives clothing only. In the eighth year six centers give both courses; two give foods only, and one gives clothing only. As noted, the three centers which require home economics in the ninth year give the three divisions. The practice, therefore, in most centers is to offer a combination of cooking and sewing in all years after the fifth year. For the junior high school this practice involves a minimum of two periods a week for home economics, one period each for foods and clothing. That two periods are only a minimum is shown by the fact that seven centers allow from three to five periods a week for required home economics in the seventh year.

Summary.—The varying types of administration of the home economics course lead to two conclusions: first, the home economics course has secured a place in the core curriculum; second, the time allotments, the order of presenting the three divisions of the subject, and the requirement of home economics in the ninth year have not yet been determined.

When home economics is introduced into the fifth year, the general practice is to offer elementary sewing. When home economics is introduced into the junior high school program of studies, both foods and clothing are given simultaneously in most centers. A progressive development of the home economics course to expand the scope of the work beyond foods and clothing into more advanced units of instruction in home furnishing, buying and marketing, textiles, household science, nursing, budgets, etc., demands that home economics be continued as a required subject into the core curriculum of the ninth year.

MATHEMATICS

Arithmetic is the only division of mathematics required in the fifth and sixth years. The extremes in the time allotments of the fourteen centers are 300 minutes a week or 60 minutes a day as the maximum and 120 minutes a week or 24 minutes a day as the minimum. Either the problem of eliminating the unessential from the arithmetic course of study has not been solved or the introduction of secondary mathematics into the first two junior high school years has resulted in a readjustment of the arithmetic course of study to the extent of making greater demands on the time schedules of the fifth and sixth years.

Further, the varying amount of arithmetic covered in the grades below the seventh year and the variable use of achievement tests, accuracy and speed drills, and other media of economizing time in the arithmetic work of the elementary school may account for the wide extremes of time allotment in the fifth and sixth years. The widespread adoption of general mathematics in the junior high school and the consequent readjustment in the grades immediately below the junior high school should have the beneficial effect of necessitating a reconstruction of the arithmetic course of study and in consequence the introduction of efforts to eliminate non-essentials, to change methods in the interest of economy of time, and to adopt standardized measurements of achievement.

The claim that elementary algebra and intuitive geometry in the seventh and eighth years as part of general mathematics practically amount to the elimination of arithmetic is not substantiated by the average proportional allotment of the mathematics time of all centers to arithmetic in the junior high school grades. The general practice of the fourteen centers is to allot 80.7 per cent of the total mathematics time of the seventh year to arithmetic and 61.6 per cent of the total time of the eighth year. A condition which did not occur in the former administration of first-year high-school mathematics now exists in the persistence of arithmetic to the extent of 17.9 per cent in the ninth year. An average of 72.1 per cent of the total time allotment to mathematics in the fifth to ninth years inclusive is devoted to arithmetic and 27.9 per cent to algebra and geometry. When arithmetic was taught exclusively in Grades 5, 6, 7, and 8 and algebra exclusively in the ninth year, 80 per cent of the total mathematics time in Grades 5 to 9 was devoted to arithmetic and 20 per cent to algebra. There is a total difference of only 8 per cent in the time distribution between the present practice and the former practice. The claim, therefore, that the introduction of general mathematics into the junior high school is practically equivalent to the elimination of arithmetic is not corroborated by the facts, at least of this investigation.

Either elementary algebra or intuitive geometry has been introduced into the mathematics course of the seventh and eighth years in more than one-half of the fourteen centers. Thus the tendency to adopt general mathematics without serious cost to the former total allotment of arithmetic time is clear. Arithmetic has been distributed through the seventh, eighth, and ninth years, and algebra and intuitive geometry have been similarly distributed. Thus elementary and secondary courses in mathematics are being articulated wholly in the interest of the pupils, who formerly were compelled to suffer an abrupt break between the two and who now by gradual stages of transition are led from one branch of mathematics to another.

The tendency is clear, but the practice is not yet uniform. The variation in the administration of the three divisions of mathematics in Grades 7 and 8 shows plainly the uncertainty which prevails. The problem of articulation is in process of solution, but uniform practice in the articulation cannot be expected without further experiments. The variation in the present practice of the fourteen centers will cause no undue concern to those who are familiar with the problem of articulating elementary and secondary mathematics.

The present stage of the experiment in articulating elementary and secondary courses into general mathematics is revealed in Table XXIV. Arithmetic is a gradually diminishing factor in general mathematics; algebra, on the other hand, is a gradually increasing factor; and intuitive geometry, which receives an average proportional allotment of 16.2 per cent of the mathematics time of the seventh year, receives but 8.6 per cent of the mathematics time in the ninth year. Striking an average for the junior high school grades only, it is found that of the total time allotted to mathematics in the three junior high school years, 54.5 per cent is devoted to arithmetic, 32.4 per cent to algebra, and 13.1 per cent to intuitive geometry. In the former administration of these grades the full time of the seventh and eighth years, that is, 66.7 per cent of the junior high school mathematics time, was allotted to arithmetic and the full time of the first year of the high school, or the ninth year, that is, 33.3 per cent, was allotted to algebra. By this analysis the difference in time allotments to arithmetic between the former practice and the present development of the general mathematics course is 12.2 per cent; algebra receives approximately the same time allotment, and intuitive geometry receives a time allotment approximately equal to the difference between the former and the present practices in time allotments to arithmetic.

The readjustment of the arithmetic course in the elementary school offsets the small proportional loss in time allotment to arithmetic in the junior high school grades. The junior high school course in general mathematics has made two forward steps: first, the introduction of intuitive geometry and elementary algebra in accordance with the primary purpose of the junior high school to discover the aptitudes of pupils for courses in higher mathematics and to reveal the ability of pupils to pursue them and, second, the articulation of elementary and secondary courses in mathematics.

Fundamentally, the needs of junior high school pupils are the sole reason for this reorganization. By both forward steps these needs have been promoted. Junior high school pupils are afforded an opportunity to discover, before the discovery involves a serious loss of time, whether or not they should elect curriculums which include courses in higher mathematics. The transition from elementary to secondary mathematics is made by gradual and natural stages from arithmetic to algebra and geometry. The former gap caused by abrupt transition between the eighth and the ninth years from elementary to secondary courses of study is thus eliminated through the articulation of elementary and secondary education, which is the chief mission of the junior high school to the public school system.

Summary.—Arithmetic is the only division of mathematics taught in the fifth and sixth years of the fourteen centers. The time allotments in these grades vary from a daily period of twenty-four minutes to a daily period of sixty minutes. The readjustment of the elementary course in arithmetic is probably caused by the reconstruction of the general mathematics course in the junior high school and is likely to develop improved practices in the elementary school, resulting in the economizing of time.

The introduction of general mathematics into the junior high school years has not caused any serious loss in time allotment to arithmetic in these years but has made it possible to include elementary algebra and intuitive geometry in the seventh and eighth years. This readjustment in the junior high school is consistent, first, with the fundamental objectives of the junior high school and, second, with the needs of junior high school pupils who benefit by the long-needed articulation of elementary and secondary courses in mathematics.

SCIENCE

Table XXIII shows clearly that in the organization of the science course of study nature study is placed almost exclusively in the fifth and sixth years and general science almost exclusively in the junior high school. No other divisions of required science are given in twelve of the fourteen centers. Of the other two centers, Atlanta combines gardening with nature study in Grades 5, 6, and 7 in the proportion of one-third and two-thirds, respectively, and Los Angeles has a combination of agriculture with nature study in the same proportion but in Grades 5 and 6 only. Nature study, therefore, is the predominating type of science in the elementary grades and general science in the junior high school grades. No other required subject shows so large a proportion of 100 per cent distribution of the total time allotment of the subject to one division of the subject in the fifth and sixth years and to another in the junior high school.

The types of science courses in the core curriculum, therefore, have been largely determined. Nature study best adapts itself to the elementary-school pupil who can be taught to observe natural phenomena but who is too immature for interpretative studies. The nature study courses deal largely with plant and animal life. The child of the fifth or sixth grade has an absorbing interest in the phenomena of the plant and animal life about him, and he is capable of receiving training in the observation of these phenomena. This training in purposeful observation becomes fundamental as a background for the general science of the junior high school and for the specialized sciences of the senior high school.

In no other course in the curriculum is there greater opportunity for the training of the powers of observation, both in range of observation and in accuracy of details. Scope and accuracy in the power to observe are educational values of large import; they are indispensable to advanced studies in science. It is possible, therefore, for the elementary school, through the child's instinctive interest in natural phenomena, to train him in the power of extensive and intensive observation and to provide a background of realistic experiences for the more systematic work of later courses. It is, consequently, an indication of an increasing articulation of elementary and junior high school courses that eight of the fourteen centers provide the elementary background courses in nature study.

However, the articulation of the elementary-school course in nature study and the general science of the junior high school is at present only a trend in the development of a continuous course through the three units of the 6-3-3 organization. The articulation has not become an established practice. Only three of the eight centers which include nature study in the elementary curriculum continue a required science course into the junior high school. In other words, five centers initiate a science course in the elementary school and discontinue it in the junior high school as a required subject.

Again, as in other subject fields, the frequently conflicting practices which the junior high school has inherited from the elementary school and the high school have not yet been adjusted. There is the tendency of the elementary school to make nature study a required course and the tendency of the high school to make science courses elective. In other words, the elementary school initiates a course in natural science which should be continuous through the junior high school and senior high school, at least to the point where other major subjects—mathematics and social studies, for example—become elective courses. But the practice of elective courses in science which the junior high school inherited from the senior high school still prevails and thus invalidates the continuity of a science constant in the junior high school.

The hope of a science constant in the junior high school program of studies is not, however, as discouraging as the lack of articulation between the nature study of the elementary school and the general science of the junior high school would seem to indicate. Science courses in the junior high school have been constructed not on the basis of nature study but on the basis of the specialized sciences of the senior high school and must usually pass through the elective stage before they become part of the core curriculum. The steps in the introduction of natural science into the junior high school seem to be, first, an elective in the ninth year; second, an exploratory and introductory course for the eighth year (six centers give required science courses in the eighth year); third, a still more elementary course in the seventh year (four centers); and the final step which only three centers have taken in the articulation of the required natural science course of the seventh or eighth year and the nature study courses of the fifth and sixth years.

Thus the nature study of the elementary school and the specialized sciences of the high school find a common meeting-ground in the junior high school, and at this point of conjunction all of the problems of articulating elementary and secondary courses of study must be solved. But the junior high school must not be expected to solve the problems without the co-operation of both the elementary school and the high school. Herein is the secret which so frequently baffles all attempts at articulation. By long-continued isolation the elementary school and the high school have constructed separate and unarticulated programs of study. In no subject of the curriculum is this development more evident than in science.

It should, therefore, cause no surprise that the articulation which the junior high school must effect is a difficult problem. Its solution can be promoted by co-operation on the part of those who are constructing nature study courses in the elementary school, elementary natural science courses in the junior high school, and science electives in the senior high school. Furthermore, progress can be made toward articulation by placing the responsibility for the articulation on the high-school teachers and the heads of the science departments.

Both the training and the experience of elementary-school teachers are more limited in science than in any other course of study. The construction and supervision of science courses in the junior high school must come, therefore, largely from those who have been trained for high-school science and who have had experience in science teaching. When once this training and experience have been transferred to the junior high school, the nearer contacts thereby made with the elementary school will promote a more rapid articulation of natural science in the junior high school and nature study in the elementary school. Thus, by gradual development, the continuous chain from nature study in the elementary school to the elective physics and chemistry courses of the senior high school will be forged, and the cumulative results of a carefully graded program of science instruction will justify a science constant in the core curriculum of both the elementary school and the secondary school.

Summary.—Science has two major divisions, as shown by the practice of the fourteen centers—first, nature study in the elementary school and, second, general science in the junior high school. The distinctions in nomenclature will disappear as articulation progresses, and science will be used to designate a continuous course of a science constant through the elementary school and junior high school and into the senior high school, at least as far as other constants are offered.

In the junior high school program of studies natural science should take rank with other major subjects, probably not in time allotments but in progressive development through all three years. The junior high school core curriculum will thus come to comprise six general units of instruction, namely, English, mathematics, social studies, natural science, health, and fine and practical arts.

SOCIAL STUDIES

United States history and community civics are the prevailing divisions of social studies in the elementary-school curriculum. Only one center, Atlanta, gives vocational civics and economic civics in the elementary course; in each case the work is closely related to the work in history or community civics. The average proportional distribution of time between history and civics is approximately 85 per cent and 15 per cent, respectively.

In the majority of the centers the history course of the fifth and sixth years deals with the historical background of American history and with United States history prior to the constitutional period. There is a particular appeal to the preadolescent, hero-worshipping age of the fifth and sixth years in the periods of discovery, exploration, and settlement and the early colonial and pioneer life. In some centers the history course of the junior high school shows a tendency to begin at the point where the work of the sixth year ends. This completion of a certain proportion of the history course in the fifth and sixth years relieves the junior high school course in history and makes possible the introduction of other divisions of social studies which characterize so generally the reorganization of the junior high school program of studies. The practice of the elementary school to restrict the history course largely to history stories and to biography and abridged elementary texts in United States history is being replaced by an articulation between the elementary school and the junior high school which amounts to a continuous course through the fifth, sixth, and seventh years and, in some centers, the eighth year.

The large average time allotment of 85 per cent to United States history in Grades 5 and 6 can and should be made a part of a progressive development in the history course. It should be noted that in the centers where articulation and continuous development have been established between the elementary school and the junior high school the proportional time allotments to community and vocational civics have been increased. In this articulation lies the hope of adding elementary economics to the present social studies course of the junior high school. This unit receives practically no attention in the junior high school at the present time.

Community civics receives a gradually increasing proportional time allotment—from 14.7 per cent in the fifth year to 54.8 per cent in the ninth year. Of all of the more recent units of instruction added to the social studies course, community civics has been the most generally incorporated with the former history courses and receives by far the largest allotments of time.

Community civics is too recent an addition to the social studies course of study to warrant an expectation of a continuous and articulated course through Grades 5, 6, 7, 8, and 9 as has been noted in the case of history. A later table reveals an overlapping of units of teaching between the elementary and junior high school grades which seems to result in an unfortunate waste of instructional time but which may be both necessary and desirable until experimentation clearly demonstrates how the units of teaching should be distributed. In some centers a purpose is evident to articulate the community civics course in a continuous development through the elementary and junior high school grades. Detroit has made the most significant progress in this respect and under the leadership of the supervisor of social science is developing continuity and articulation through the whole social science field.

In many centers the course in community civics has been constructed from two almost independent points of view, namely, the elementary school and the junior high school. Courses of study are, as a result, independently developed and administered, and the consequent lack of continuity is evident in the overlapping of the units of teaching. However, the investigation discovered not only in Detroit but in other centers a purpose to articulate the practices of the elementary school and the junior high school in the teaching of both community civics and other social science courses. The isolation of the elementary-school and junior high school courses should not extend beyond the period necessary to demonstrate by experience which units of teaching are suited to the two schools. The present duplication of time and effort will disappear as the consciousness of the wasteful practice of needless overlapping comes by experience to both elementary-school and junior high school teachers.

Vocational civics is finding its way into the core curriculums of the eighth and ninth years. It should be recalled that Tables XXIII and XXIV are restricted to the required subjects. Many elective courses in history, community civics, and vocational and economic civics do not enter into the percentages given in Table XXIV. The wide range of elective courses in social studies was discussed in connection with Table XXII. Vocational civics deserves recognition in the core curriculum of the junior high school far beyond its present adoption. The tendency to make vocational civics a part of the required social studies constant is evident in the average proportional time allotments of the eighth and ninth years and in the fact that five of the eleven junior high school centers include it in some one or more of the junior high school years.

The mission of the junior high school is to reveal to pupils, first, through general exploratory courses their own aptitudes and interests;

second, the educational possibilities for the training of their aptitudes and the development of their natural interests; and, third, the vocational opportunities in which the aptitudes and interests when revealed and developed may find proper and useful employment. On vocational civics and other similar guidance work of the junior high school falls the burden of the third objective. Vocational civics, therefore, is an integral part of a social science course, but, even more important, it is fundamental to the purposes of the junior high school.

After revealing to an early adolescent his aptitudes and interests and the educational possibilities for the training of his endowed powers, to deny him a vision of the vocational opportunities into which he will fit—in other words, to refuse him vocational civics—is to rob him of the motivation which will condition his educational progress. The junior high school must be more than a finding school. It has an even greater purpose—to become an educational motivating agency; hence its general exploratory courses to reveal aptitudes, the articulation of elementary and secondary courses of study to reveal the ability to pursue higher education, and the guidance and vocational civics courses to furnish the motivating impulse of vocational ambition.

The fact that economic civics appears as such a minor division of the social studies course is due to several conditions. First, it has been forced to await the development of the courses in community civics and vocational civics. Second, there has been very limited experimentation in the senior high school in the teaching of elementary economics, which, like other new units of instruction in the senior high school program of studies, could be readjusted to the junior high school. Third, several units of teaching which properly belong to economics have been incorporated into the community civics course. In other words, there is a consensus of opinion that economic civics as a distinct division of social studies is unnecessary but that it should be included as a part of the community civics course. Undoubtedly, this last point of view is wholly justified, and all present divisions of social studies should be assimilated into a general social science course of study.

The tendency to fuse more or less isolated divisions of social studies into social science has been discussed in connection with Table XXII. The transitional step of developing each isolated division to the point where experimentation can determine the selection of units of teaching from each division for a fusion of all divisions into social science has been and is being taken in connection with history, geography, community civics, and vocational civics, but unfortunately this transitional step is not taken for economic civics. The result is a wholly disproportional emphasis on the important factors of industrial and economic life. The traditional phases of governmental civics, the more recent phases of social and community relationships, and to a limited degree vocational civics have largely crowded out of social studies courses the economic and industrial phases. A transitional stage of developing economic civics as a distinct division of social studies should be passed through. Thus a true evaluation can be reached of such vital phases of social science as production, distribution, transportation, relation of capital and labor, and economic principles, laws, and customs.

Economic civics conditions every individual and all community life. This division of social studies deserves recognition in social science courses far beyond the present limited and incidental attention given to it. It has not and doubtless will not receive this recognition until the transitional step has been taken to determine its value as compared with other social studies courses and particularly to determine materials and methods in adapting courses in economics to the elementary school and the junior high school.

Summary.—The distribution of the units of teaching in United States history as a continuous course through Grades 5 and 6 and the first year or two of the junior high school will relieve the social studies course of the junior high school and thus permit the introduction of courses in community, vocational, and economic civics.

Community civics ranks second to United States history in time allotments and in the present development of its materials of instruction. The articulation of the community civics courses in the elementary school and the junior high school has not advanced to the point reached by the articulation of the history courses. There is an evident consciousness of the need of the articulation, however, and deliberate and well-planned efforts are being made to effect it.

Vocational civics is finding a place in the core curriculum of the junior high school. The inherent values of vocational civics in attaining fundamental junior high school objectives will win for this division of social studies an increasing proportion of time allotment. Vocational civics is likely also to secure a share in the guidance program of the junior high school. The chief deterrent to a more rapid development of vocational civics is the present lack of courses of study and suitable textbooks.

Economic civics as distinguished from all other courses in social studies has not passed through the transitional stage of a distinct course of study. Consequently, the relative values of such important units of teaching as industrial production, distribution, transportation, and economic practices have not been determined. Elementary economics is incidental to other courses of study and receives the inadequate recognition which invariably characterizes incidental development. The materials and methods of teaching in economic civics must be determined before this division of social studies can be incorporated with the social science courses.

The most direct way to the proper recognition of economic civics is through the same development which won for community civics and is now winning for vocational civics just recognition in the reconstructed social science courses. The transitional stage of a distinct and more or less isolated development of materials and methods has brought the courses in community and vocational civics to their present general adoption in the core curriculum. A similar stage of development and evaluation of the materials and methods in economic civics may have the unfortunate result of delaying the fusion of all social studies into general social science, but it will have the fortunate result of securing recognition for economic civics commensurate with its important values and also of securing a more balanced social science course.

INDUSTRIAL ARTS

The wide variations in practice in the administration of the industrial arts course of study have been discussed in connection with Table XXII. Table XXV reveals the same wide range of practice both in types of courses and in time allotments to all grades. Naturally, the variation is not so great in the elementary school where long-continued experimentation with manual training has developed uniformity of practice. Nine of the fourteen centers include some type of industrial arts in the fifth and sixth years.

There are various designations for the types of work given, but all types are closely related to the course in manual training which is the original type generally found in the elementary school. All courses are based largely on woodwork with varying stress on mechanical drawing and home mechanics. In most cases only one course is offered in the fifth and sixth years, and this course is continuous through both years. Eight of the nine centers allot one period a week of varying length (from 60 to 150 minutes). Kansas City requires three periods of a total of 180 minutes a week in both the fifth and the sixth years, but it also makes industrial arts elective in the seventh and ninth years. The practice, therefore, in the elementary school is nearly uniform as to

TABLE XXV

NUMBER OF MINUTES A WEEK ALLOTTED TO THE SUBJECT DIVISIONS OF INDUSTRIAL ARTS

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Grade 5:														
Manual arts											75			
Manual training							90	180				75		
Manual training and home mechanics		90												
Manual training and mechanical drawing			60			90								
Wood shop									90					
Grade 6:														
Bench work in wood							90							
Manual arts											150			
Manual training							90	180				75		60
Manual training and home mechanics		90												
Manual training and mechanical drawing			60			90								
Wood shop									90					
Grade 7:														
Applied science												180		
Electricity		170*											130*	
General shop											180†			
Household mechanics							240							
Manual training and mechanical drawing			60											
Mechanical drawing				90‡		50§	60							
Metal-work													130*	60
Option of special shops‖									210	275				
Woodwork (manual training)		170*		180	100	200**							130‡	60

* Quarter-year course.

† A second course of 120 minutes is also offered.

‡ Half-year course.

§ Twelve-week course.

‖ See Table XXII.

** Twenty-six week course.

TABLE XXV—*Continued*

	Atl.	Ber.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
Grade 8:														
Auto mechanics	X*	....	X	....	....	....	360†	X	....	....	....	....	....	....
Electricity	X	....	X	....	....	....	360†	X	....	....	....	....	....	....
Machine shop	X	....	X	....	....	....	360†	X	....	....	....	....	....	....
Mechanical drawing	X	....	X	90	....	60‡	120§	X	....	....	....	....	....	....
Metals (sheet metal)	X	170	X	....	....	....	....	X	....	....	....	....	....	60
Option of special shops‖	X	....	X	180	....	....	....	X	210	275	240**	180	....	....
Printing	X	....	X	....	....	....	360†	X	....	....	....	....	....	....
Woodwork (manual training)	X	....	X	....	100	190††	....	X	....	....	....	....	....	60
Grade 9:														
General shop	....	....	225	....	....	....	60	....	....	....	....	....	....	....
Mechanical drawing	....	....	....	....	....	....	180‡‡	....	....	....	....	....	....	....
Option of special shops‖	....	....	....	....	....	....	....	....	210	....	240**	180	....	....

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* X means that the school system is organized on the 7-4 plan and does not include an eighth grade.

† Quarter-year course.

‡ Four-week course.

§ A second course of 60 minutes is also offered.

‖ See Table XXII

** A second course of 120 minutes is also offered.

†† Fifteen-week course.

‡‡ Two other courses, one of 60 minutes and one of 120 minutes, are also offered.

type of course, its continuous development through the fifth and sixth years, and the time allotment of one period a week; but the time allotment varies in the number of minutes a week from a minimum of 60 minutes to a maximum of 180 minutes.

Eight centers which require industrial arts courses in the elementary school continue the requirement into the seventh year; one center makes the seventh-year work elective; four centers first introduce industrial arts into the curriculum in the seventh year. In other words, all but one of the centers require industrial arts in the seventh year.[1] The type of course required in the seventh year is different from the type required in the fifth and sixth years in all but one center. Of the four centers which introduce industrial arts in the seventh year, two require woodwork and mechanical drawing; one offers an option of several special shops, and one gives a combination of woodwork, electricity, and metal-work.

The general practice, therefore, is to require a more general type of industrial arts course at the beginning of the junior high school than in the fifth and sixth years. This practice is consistent both with the principle of the progressive development of industrial arts in the elementary and junior high schools and with the primary purpose of the junior high school to explore the aptitudes of its pupils before choices in elective subjects are offered.

All but one of the centers increase the time allotment in the seventh year both in the total number of minutes and in the number of periods a week. The range of variation in the time allotments is from one to five periods a week and from 60 to 300 minutes a week. As pointed out in a previous discussion, industrial arts has won a place in the junior high school program of studies, but neither the type of course nor the time allotment has been definitely determined. Some tendencies, however, are evident: eight centers expand the course in woodwork to include metal-work, general shop, electricity, applied science, household mechanics, etc.; of these eight centers, two give an option of special type shops, and six give a combination of courses variously designated as general shop, etc.; further, the plan to give industrial arts a more prominent place in the core curriculum is shown by the increased time allotments.

The progressive development of the industrial arts course through the three years of the junior high school is practically general in the fourteen centers. This becomes clear in a comparison of the types of courses required in the seventh and eighth years. In the eighth year only two centers give courses devoted exclusively to woodwork; one gives a combination of woodwork and metal-work; one gives a course devoted exclusively to metals; and six give options in special type shops. This practice also is consistent with the progressive development of the junior high school industrial arts course and with the purpose of trying out the aptitudes of pupils. General practice, therefore, in the fourteen centers favors a required course in industrial arts in the seventh and eighth years, an increase in time allotments, and a progressive and gradually expanding type of shopwork.

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[1] Atlanta includes industrial arts in its new junior high schools opened in September, 1923.

Table XXV reveals the unfortunate result in the ninth year of making the last year of the junior high school a part of the senior high school so far as accrediting relations with the colleges are concerned. Only five centers continue industrial arts as a part of the core curriculum. As so frequently shown in connection with other subjects in the curriculum, the principle of continuity in the progressive development of a junior high school course of study must be sacrificed under present conditions. The undemocratic principle of shaping the core curriculum in the junior high school, which compulsory education laws require all pupils to attend, to meet the needs of the few who later attend college is harmful both to the pupils who leave school in the junior high school period and to the pupils who continue into higher institutions. Both groups are deprived of the valuable social influences of a large core curriculum of common subject interests.

Further, many subjects which are a common need to both groups cannot be organized or administered as consistent and progressive units of instruction in the junior high school program of studies under the present widespread practice of making required subjects of the seventh and eighth years elective in the ninth year. The core curriculum of the junior high school is being steadily determined in the seventh and eighth years of the junior high school, but the core curriculum of the junior high school as an integrated unit of public school administration cannot be determined until the junior high school is relieved from the domination of college-entrance requirements.

Summary.—Industrial arts in the fifth and sixth years in the general practice of the fourteen centers takes the form of manual training or woodwork for one period a week, approximately 90 minutes in length.

Industrial arts in the seventh and eighth years is expanded to include both woodwork and metal-work and takes the form of a general shop course, household mechanics, applied science, or an option of several type shops.

There is a continuous and progressive development of the required industrial arts course through the fifth, sixth, seventh, and eighth years. This progressive development continues into the ninth year in five centers but is abruptly halted in the other centers by a change to elective subjects.

The junior high school program of studies is in desperate need of immediate relief from college domination which can be most readily secured by reducing college-admission requirements from sixteen to twelve units, that is, restricting accrediting relations to the senior high school.

PENMANSHIP

The questionnaire in penmanship, unlike the questionnaires in all other subjects, included Grades 1-4 with Grades 5-9. The report, therefore, is complete for both the elementary school and the junior high school, as shown in Table XXVI. The average time allotments in number of minutes a week are as follows: first grade, 69.6 minutes; second grade, 77.3 minutes; third grade, 80.0 minutes; fourth grade, 81.9 minutes; fifth grade, 81.9 minutes; sixth grade, 80.4 minutes; seventh grade, 69.1 minutes; eighth grade, 71.0 minutes. When penmanship is offered in the ninth year, it is, in most cases, either part of the commercial curriculum or an elective for those pupils deficient in penmanship.

TABLE XXVI

NUMBER OF MINUTES A WEEK ALLOTTED TO PENMANSHIP

Grade	Atl.	Bir.	Cle.	Dec.	Den.	Det.	K.C.	L.A.	Okm.	Pit.	Roc.	St. L.	Som.
1	75	50	100	50	75	100	50*	75	50	100	50	80	75
2	75	50	100	75	75	100	75	75	50	100	75	80	75
3	75	75	75	75	100	75	60	75	75	100	75	80	100
4	75	75	75	75	100	75	80	60	75	100	75	100	100
5	75	75	75	75	100	75	80	60	75	100	75	100	100
6	75	75	75	75	100	75	60	60	75	100	75	100	100
7	75	60	....	50	80	75	125†	200*	135‡	50	60	60	60
8	X§	X	....	50	80	75	X	200	135‡	50	30	60	60
9	75	....	....	100	....	....	....	200	....	....	....	....	....

* Half-year course.

† Elective.

‡ Quarter-year course.

§ X means that the school system is organized on the 7-4 plan and does not include an eighth grade.

All of the centers with two exceptions (there are no returns for Berkeley) continue penmanship as a required course through the eighth year or in the case of the 7-4 school systems through the seventh year. In over one-half of the centers there is a reduction in time allotments in the junior high school. A few centers provide for the exemption of pupils from penmanship in the junior high school on the attainment of certain standards. The quotations from the teachers' reports which follow indicate the practice adopted in exempting pupils. The tendency to exempt junior high school pupils from both spelling and penmanship on satisfactory evidence of achievement has to a significant degree manifested itself in the administration of the junior high school program of studies.

With the wide use of achievement tests and with the general acceptance of standards of achievement, the trend toward relieving pupils of unnecessary attention to work already accomplished will contribute to the solution of many problems in the present administration of the time schedule.

Certain devices for providing time allotments in penmanship for those pupils who need further practice and instruction are noted in the quotations which follow. Adaptation to individual needs has long been a desideratum in the junior high school. Both the practice of exempting pupils who have satisfied attainment standards and the practice of providing special classes for those who have not reached these standards are practices which reveal practical adaptation of requirements to individual needs.

The junior high school program of studies has been so enriched that the pupils capable of benefiting to the greatest extent therefrom should not be deprived of the opportunity by the persistence of traditional practices when these practices may be modified by widely accepted measurements of achievement. Penmanship, particularly, is one of the traditional subjects which has been taught through the eight years of the elementary school and which may, through the recent development of tests and measurements, be dropped from the core curriculum of the junior high school except for the few pupils who need further instruction.

The following comments made in the teachers' reports will be of interest to those concerned with the present status and the probable development of penmanship in the junior high school:

Atlanta.—Pupils are exempted from penmanship when fair writing has become fixed in the grades beyond the first year of the high school [eighth school year in a 7-4 school system]. Three years ago we enlisted the co-operation of the ——— Pen Company to the extent that they gave as a prize in each grammar-school grade, beginning with the third, a fountain pen for the greatest improvement in penmanship during the year. The winners were determined in the following manner: an article seventy-five words in length was written by every pupil. The same article was written at the close of the school year. The two copies made by each pupil were fastened together. Judges were appointed to determine in each class the pupil who had made the greatest improvement between the first and the second copies.

Birmingham.—Penmanship is correlated with English in phonics, spelling, and all written papers, practice on titles to be used in composition, instruction on forms to be used in composition books, addressing envelopes, etc.; with history—writing lessons are built around the names of great men and important incidents in history; with geography—writing lessons are given on names of sections, cities, states, and products; where projects are being prepared, the writing period is given over to the writing involved in the project. To stimulate interest progress pins and certificates are awarded. We enter papers, spelling blanks, and composition books in the state fair for prizes. We have an exhibit for the Alabama Education Association meeting. Good papers are displayed in individual classrooms.

Cleveland.—Penmanship is correlated with the written work of other subjects through the correction of errors with stress on the emphasized features of each grade; such exercises become "applied penmanship." Measuring models are supplied by the penmanship department with grades of 90, 80, etc. To stimulate interest, the measuring models are employed, also exhibitions, special decorations such as stars, and other awards.

Decatur.—In order to stimulate interest and enthusiasm we often use the two-group plan which permits the teaching of advanced pupils in one group and those who find the work difficult and are in need of more basal training in the other group. Penmanship practice is frequently carried on with music to obtain rhythmical count for various exercises—for example, all capital and small letters—to conserve the vitality of the teacher by eliminating much of the counting, and to enable the teacher to give more attention to position, movement, and form while the lesson is in progress. We exempt pupils temporarily if they have earned the elementary-school penmanship diploma and permanently when they have earned the high-school penmanship diploma.

Denver.—We aim toward appropriate speed for each grade; Starch's standard is used. We exempt temporarily in the sixth, seventh, and eighth years when "A" quality on the Denver Handwriting Scale is secured. The exemption continues and becomes permanent when all written work is kept up to the standard. During the regular penmanship period drill is given on figures in mathematics and on the written work in English, history, and geography. Pupils compare the written work with the Denver Handwriting Scale. At the close of each term the teachers from Grade 3 A to Grade 8 A send specimens of the writing of their pupils to the supervisor of penmanship. Each teacher places her O.K. on the papers she considers worthy of certificates. The supervisor examines the papers and by combining judgments grants certificates to those who have reached the "A" standard of the Denver Handwriting Scale. In Grades 3–5 movement is the basis of award; in Grades 6–8, proficiency.

Detroit.—In all grades the course offers opportunities to equip the child with a means to help himself, to progress at his own rate, and to grow in self-direction, self-control, and self-appraisal. Follow-up work is done in all subjects; pupils are stimulated to maintain standards of good writing. The standard of exemption in the eighth grade is 70–80 on the Ayres scale, and the exemption is permanent when the quality of writing continues good in all of the writing done. On completing the series of lessons in the course the pupils are given small certificates which state the rate and quality attained.

Kansas City.—Penmanship is elective in the seventh year for two and one-half periods a week of 50 minutes each or 125 minutes a week. A special penmanship teacher is in charge of two groups. These two groups alternate two days one week and three days the next. Poor writers are urged but not required to enrol. Speed tests and quality tests are employed; comparisons are made with standards, and the rate of improvement and the quality are noted.

Los Angeles.—In all grades correlation with respect to legibility and position is sought in all written work in English and the social studies. Pupils are exempted in the ninth year on the attainment of a standard of 80 per cent on the Zaner scale. Interest is stimulated in Grades 7, 8, and 9 by exhibitions of penmanship and by the awarding of penmanship certificates.

Okmulgee.—Correlation is secured in connection with composition and story-writing and by exhibition of superior work. There are many projects [Okmulgee's Project Plan Bulletins are most suggestive] in which good penmanship is stressed.

Pittsburgh.—In the grades the teacher inspects and observes written work in all subjects and suggests improvement in position and form. Exhibits of handwriting are made in all grades, and measurement tests are given in Grades 5–7. Certificates are used in the eighth year. In the junior high school ratings are given on all written work.

Rochester.—Special penmanship teachers are employed in the junior high school. Pupils are rated solely on their daily written work in other subjects. A local investigation among business men has been conducted to determine the kind of writing best suited to business purposes. A system of awards—stars; improvement certificates; green, red, and gold seal certificates; and penmanship pins—has done much to stimulate increased proficiency. In the junior high schools these awards are made in a penmanship assembly each semester.

St. Louis.—Pupils are exempted temporarily for a period of five weeks when the quality of daily writing is equal to or better than the median of the scale. Permanent exemption is granted in the seventh and eighth years after several periods of temporary exemption. An investigation to determine the kind of writing best suited to business purposes resulted in a modification of the standards previously established by the schools. A part of the time devoted to the writing lessons is employed to correct errors detected in the daily written work in position, movement, size, spacing, and form.

Somerville.—The penmanship work is done by the grade teachers under the supervision, approximately once a month, of the penmanship supervisor. Correlation with the written work of other subjects is secured by the grade teacher's comment on the method used and the result attained. Awards are given in Grades 1–6, and class ratings are given in Grades 7–8. There is no penmanship in the ninth year except in the commercial curriculum.

Twelve of the fourteen school systems reported on the description of the penmanship course and the emphasized features. The reports are here summarized. The figures indicate the number of the twelve centers in which the particular feature applies or is stressed.

Description of course.—Muscular movement: first grade, 4; second, 10; third, 11; fourth, 12; fifth, 12; sixth, 12; seventh, of 10 centers requiring penmanship, 10; eighth, of 8 centers requiring penmanship, 8. Blackboard writing: first grade, 11; second, 7; third, 2. Finger movement: first grade, 1; second, 2.

Emphasized features.—Position: first grade, 6; second, 10; third, 10; fourth, 11; fifth, 8; sixth, 7; seventh, of 10 centers, 6; eighth, of 8 centers, 3. Size: first grade, 6; second, 8; third, 5; fourth, 3; fifth, 6; sixth, 5; seventh, of 10 centers, 6; eighth, of 8 centers, 5. Freedom: first grade, 7; second, 6; third, 10; fourth, 9; fifth, 7; sixth, 8; seventh, of 10 centers, 8; eighth, of 8 centers, 6. Form: first grade, 7; second, 6; third, 6; fourth, 10; fifth, 11; sixth, 12; seventh, of 10 centers, 10; eighth, of 8 centers, 7. Speed: first grade, 1; second, 1; third, 2; fourth, 5; fifth, 5; sixth, 5; seventh, of 10 centers, 3; eighth, of 8 centers, 4.

CHAPTER VII

UNITS OF TEACHING

This chapter, the final chapter of the report, carries the analysis one step farther than it has been carried in the earlier chapters. The units of teaching into which the courses may be subdivided are here compared with reference to the frequency with which they are taken up in the various centers and with reference to the proportional time which they occupy. By the term "unit of teaching" is meant one group of topics which can be taught in a closely related series of class exercises, as, for example, all of the discussions in English grammar which relate to sentences or all of the items in geography which relate to Africa.

These units of teaching were more or less arbitrarily selected. In the selection, however, attention was given to the usual or common practices of today as revealed in the classroom procedure adopted by progressive teachers. Exceptional practices not generally found in school systems were disregarded.

In order that the units of teaching should reflect as fully as possible the best practice, the writer enlisted the co-operation of experienced supervisors and teachers with whom he had been associated and in whose judgment he had confidence. Further, the outlines prepared were subjected to the criticism of a number of experts before they were finally duplicated for the use of the classroom teachers in the fourteen school systems.

The tables of results presented in this chapter are made up on the basis of the units of teaching arrived at by the methods described. Space does not permit the reproduction of the complete forms used by the teachers in the fourteen centers. For those readers who may be interested in the materials by reason of a desire to compare the technique of this investigation with the technique of similar investigations, a few sets of the blanks have been preserved. The writer will be glad to lend to those who are interested a complete set of the outlines, report forms, and special questionnaires.

The returns from the various centers are by no means complete, and in some instances the statements made are of such a character that it was difficult to tabulate them. The tables may, however, be relied upon as representing fairly well the general tendencies of school practice in the cities investigated.

No separation has been attempted in this chapter of constants and electives. It sometimes happens that the same general subject is given as both required and elective work. The combination of all teaching time, whether in constants or electives, as the basis for calculation of proportional time allotments results in figures in this chapter which are not directly comparable to those reported in earlier chapters. Discrepancies will accordingly be found between the figures in chapters iv–vi and those in this chapter.

Beyond reporting the figures in tables, this chapter will not attempt to present the practices of the schools with regard to the units of teaching. The variations are so striking in quantity and general character that the case is proved by the figures without comment. Especially is Table XXX impressive as showing how widely the American schools have diverged from one another.

In all tables where percentages are given to represent the proportional distribution of time allotments the percentages are based on the positive cases, that is, on the number of centers reporting, whether this number is fourteen or any part of the total.

Table XXVII shows that the different cities arrange the instruction in art and music in the various grades on plans which are strikingly at variance.

Table XXVIII gives the proportional distribution of the time allotments for all centers to the units of teaching, using the total time given to a subject in a semester as the basis of calculation. It will be noted that in most cases the percentages are computed separately for the two semesters of each grade. An average of the two semesters will readily give the practice for a whole grade.

In Table XXIX the time allotments of each unit of teaching are given in terms of the percentage of the total time devoted to the unit of teaching in each semester in Grades 5 to 9. The relative emphasis on a unit of teaching in a given semester is thus indicated.

Table XXX shows variations in practice in the administration of the units of teaching. The divergences of present practices revealed in this chapter offer final and convincing proof of the universal need of a scientific reconstruction of the curriculum. The primary objective of this investigation is thus realized in that the results contribute convincing evidence of the need of a comprehensive and national program of scientific curriculum reconstruction. It is quite unthinkable that all of the practices shown to be in use even in these conspicuous centers are equally effective. Variation has gone too far to be either normal or acceptable.

TABLE XXVII

Summary of the Reports concerning the Art and Music Courses*

	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
Description of art courses:					
Art applied to commerce and industry	5	5	6	5	4
Art applied to costume	6	6	4	5	4
Art applied to home	11	11	9	8	5
Expression and technique	9	8	8	8	5
General appreciation	14	14	10	8	6
Taste and general culture	13	13	10	8	6
Emphasized features of art instruction:					
Basketry	5	5	5	6	6
Batik	3	3	3	3	4
Bookbinding	....	1	2	3	3
Civic beauty design	3	3	1	2	2
Color study	9	9	8	7	5
Commercial art	3	4	4	4	4
Costume design	6	5	2	2	2
Decorative design	10	10	8	7	4
Drafting	....	....	....	....	1
Enameling	....	....	4	4	4
Form decoration	2	2	3	3	1
Illustration	9	8	5	4	2
Industrial design	1	2	2	2	4
Lamp-shade design	1	1	3	3	3
Leather work	....	....	1	2	2
Lettering	11	11	7	7	5
Linoleum block	3	3	9	8	8
Memory drawing	8	8	6	3	4
Metal work	1	1	2	3	3
Modeling	4	4	9	8	8
Nature drawing	11	11	8	7	3
Object drawing	11	11	8	6	5
Pose drawing	5	5	1	....	2
Pottery	1	1	....	....	....
Practice of design	9	9	7	7	4
Stenciling	4	4	8	7	8
Still life	8	8	6	4	2
Structural design	5	5	3	4	4
Theory of design	6	7	4	3	5
Weaving	5	5	2	2	2
Wood-block printing	2	2	1	1	1
Woodwork	1	1	....	2	2
Emphasized features in the required courses in music:					
Appreciation	5	5	5	3	3
Elementary theory	8	7	7	7	7
Interpretation	9	9	10	9	8
Sight reading	13	12	12	10	5
Song singing	9	10	10	9	8
Voice management	7	7	9	7	6
Required music credited	4	4	5	4	5
Required music not credited	8	8	8	7	4
Elective music credited	1	1	4	3	8
Elective music not credited	8	8	8	7	5

* The figures in the table refer to the number of centers which checked the various items.

TABLE XXVIII

Time Allotments of Each Semester Distributed Proportionally to the Units of Teaching*

	Grade										
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	All
English (grammar):											
Sentence	36.6	33.1	30.4	19.4	24.0	12.9	7.7	3.7	14.0	17.2	18.0
Parts of speech	40.8	51.2	35.6	26.1	20.0	17.6	6.0	7.1	19.7	6.2	18.9
Nouns	5.7	2.6	13.8	14.1	10.2	5.2	21.9	3.7	5.9	8.9	9.6
Pronouns	6.9	6.9	6.4	13.1	22.2	5.9	25.9	2.3	8.1	7.5	11.4
Adjectives	2.6	6.2	3.3	4.3	4.6	4.6	2.8	10.2	4.5	3.6	4.7
Adverbs	3.1	.....	2.8	1.9	4.3	4.5	1.9	7.7	4.1	3.6	3.8
Prepositional phrases	.....	.....	3.7	10.2	4.8	12.1	5.3	3.0	4.5	6.2	6.0
Verbs	4.3	.....	4.0	5.4	7.1	15.5	17.6	18.0	12.9	26.2	12.7
Clauses	.....	.....	.....	5.5	1.1	19.3	9.7	25.1	13.0	9.3	9.4
Structures for varying expression	.....	.....	.....	.....	1.7	2.4	1.2	19.2	13.3	11.3	5.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Geography:											
Local district	3.0	2.7	2.0	.4	5.5	1.8	3.2	.....	.....	.....	2.6
Life in the state	4.1	2.7	2.0	1.8	9.7	3.2	12.6	.....	.....	.....	4.3
United States	43.7	15.4	19.0	25.0	13.5	18.3	22.3	.....	.....	.....	22.8
World as a whole	27.6	35.1	11.5	23.1	20.2	15.0	22.9	.....	.....	.....	22.4
Africa	.....	.....	4.2	8.8	3.8	6.0	.....	.....	.....	.....	3.6
Asia	.....	.4	5.8	13.0	4.5	12.2	.....	.....	.....	.....	5.5
Australia, etc.	.....	2.2	.....	5.2	3.1	9.8	.....	.....	.....	.....	2.9
Europe	.....	.....	33.4	15.5	18.1	9.3	.....	.....	.....	.....	12.6
North America other than United States	7.7	18.1	2.1	1.7	.....	.....	.....	.....	.....	.....	4.9
South America	.....	17.3	9.4	.....	.....	7.2	.....	.....	.....	.....	5.3
General geography†	13.9	6.1	10.6	5.5	21.6	17.2	39.0	.....	.....	.....	13.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	.....	.....	.....	100.0

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* The percentages were obtained as follows: (1) The total of all of the time allotments to a given unit of teaching was secured for each semester; the total for the first unit of teaching in grammar in Grade 5-1 is 1,056 minutes; in Grade 5-2, 961 minutes, etc. (2) The sum total of the total time allotments to all units of teaching in each subject was secured for each semester; the sum total for all units of teaching in grammar in Grade 5-1 is 2,890 minutes; in Grade 5-2, 2,900 minutes, etc. (3) The ratio of the total time allotment for a unit of teaching in a given semester to the sum total for all units of teaching in the subject is the average proportional distribution of the total time allotment of the given semester to the respective unit of teaching; the ratio of 1,056 minutes, the total for the first unit of teaching in grammar in Grade 5-1, to 2,890 minutes, the sum total for all units of teaching in grammar in the same semester is 36.6 per cent, which is the percentage of the total grammar time in Grade 5-1 devoted to the first unit of teaching.

† General geography includes physical, mathematical, regional, economic, commercial, industrial, and historical geography.

TABLE XXVIII—*Continued*

	GRADE										
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	All
Health:											
Hygiene:											
Health habit formation	21.9	17.0	17.7	11.5	14.7	8.6	10.7	7.7	11.1	8.6	12.9
Health information	10.8	12.5	9.9	10.3	8.0	9.3	10.0	6.7	6.3	3.9	8.7
Health ideals	3.2	1.5	1.4	2.0	2.7	2.8	1.8	1.3	1.2	.3	1.9
Attitude of individual responsibility	2.3	1.7	2.2	2.7	3.4	2.7	2.2	2.9	.6	.2	2.1
Physical education:											
Formal work	17.3	18.8	19.3	18.8	26.2	25.8	28.0	28.6	28.7	30.4	24.2
Swimming	2.5	2.8	2.8	2.5	1.0	3.5	......	3.4	1.8	5.1	2.6
Rhythmic work	12.8	14.0	14.3	15.4	8.3	10.7	8.1	11.6	9.3	13.0	11.7
Play and games	12.1	13.0	13.3	16.0	12.6	12.7	11.8	12.5	12.5	13.9	13.1
Highly organized games and athletics	9.4	10.3	10.5	13.3	17.1	18.5	19.9	18.4	21.9	18.1	15.8
Organized recess	7.7	8.4	8.6	7.5	6.0	5.4	7.5	6.9	6.6	6.5	7.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Home economics:											
Home and family:											
Home	5.7	6.8	5.9	5.0	5.0	6.9	8.8	4.7	5.5	5.4	6.0
House	1.4	1.4	6.3	4.1	1.1	1.0	6.2	6.3	3.7	4.8	3.9
Family	2.9	2.7	2.9	3.6	1.7	2.6	1.7	4.1	7.4	5.6	4.2
Foods:											
Meal planning, etc.	2.9	24.7	36.2	36.3	32.3	41.6	21.8	32.8	30.6	26.2	29.6
Food care, etc.	......	......	5.0	4.8	6.9	7.4	8.7	10.0	4.0	3.2	5.6
Food industries	......	......	3.2	2.1	3.8	2.9	3.8	1.7	5.2	1.8	3.0
Clothing:											
Ready-made articles, etc.	9.2	9.2	11.3	9.5	4.7	7.9	1.3	9.1	2.4	3.3	4.9
Care, repair, etc.	8.5	2.2	1.1	3.5	14.3	6.0	15.9	4.0	2.5	4.6	6.8
Construction, etc.	67.1	50.8	27.0	28.9	27.5	21.6	28.8	25.3	35.5	39.9	32.8
Clothing industries	2.3	2.2	1.1	2.2	2.7	2.1	3.0	2.0	3.2	5.2	3.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE XXVIII—*Continued*

	GRADE										
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	All
Latin:											
Vocabulary	......	......	......	......	16.0	8.7	12.0	11.0	12.3	11.8	11.7
Grammar	......	......	......	......	12.0	13.7	12.3	11.5	11.9	10.2	11.5
Forms	......	......	......	......	12.0	16.4	14.2	15.7	14.8	10.5	13.6
Latin to English (prepared)	......	......	......	......	24.0	16.4	12.3	14.3	20.1	20.7	18.1
Latin to English (sight)	......	......	......	......	4.0	8.2	7.9	9.0	10.1	14.5	10.7
English to Latin (prepared)	......	......	......	......	20.0	13.7	11.3	11.3	13.6	14.4	13.3
English to Latin (sight)	......	......	......	......	2.0	15.8	8.2	6.9	6.6	6.5	7.5
Relation of Latin to English	......	......	......	......	8.0	4.4	14.5	12.6	6.4	6.4	8.4
Relation to other foreign languages	......	......	......	......	......	.5	1.9	1.7	.8	1.0	1.1
Roman history	......	......	......	......	2.0	2.2	5.4	6.0	3.4	4.0	4.1
Total	......	......	......	......	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mathematics:											
Arithmetic:											
Fundamental operations	82.0	76.8	55.5	24.9	27.6	16.1	7.2	6.3	4.0	......	28.1
Tables of weights and measures	13.2	15.0	25.3	23.7	5.2	3.4	2.4	6.6	1.2	......	8.9
Percentage	.8	3.3	14.8	39.4	29.9	29.1	13.9	15.3	2.6	.2	14.4
Mensuration	.5	1.5	3.3	8.1	4.1	11.7	8.4	5.8	1.6	......	4.4
Social arithmetic	3.5	3.4	1.1	3.9	12.5	19.3	21.3	19.2	4.4	7.1	9.6
Intuitive geometry:											
Direct measurement	......	......	......	......	4.4	1.7	1.9	.7	2.0	1.0	1.3
Mensuration	......	......	......	......	3.0	3.4	6.1	10.4	.8	......	2.3
Indirect measurement	......	......	......	......	2.3	2.5	.8	2.2	1.4	.6	1.1
Geometric forms	......	......	......	......	7.5	7.1	9.5	11.4	1.7	2.0	3.9
Algebra:											
Formula	......	......	......	......	1.0	.3	5.3	5.3	5.7	8.0	2.8
Graphic representation	......	......	......	......	2.1	1.0	2.2	1.5	6.8	6.3	2.2
Positive and negative numbers	......	......	......	......	......	.3	.5	1.7	10.0	6.5	2.2
Equations	......	......	......	......	.4	2.0	9.1	8.7	19.0	29.6	7.7
Algebraic technique	......	......	......	......	......	2.1	11.4	4.6	37.2	35.8	10.5
Numerical trigonometry	......	......	......	......	......	......	......	.3	1.6	2.9	.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE XXVIII—*Continued*

	Grade										
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	All
Modern languages:*											
French:											
Pronunciation						13.0		12.8		6.5	9.5
Grammar						11.6		15.4		19.9	17.3
Vocabulary						22.6		11.1		9.3	11.8
Oral work						10.9		15.9		15.1	14.7
Dictation						5.2		5.9		3.0	4.2
Written work						7.9		10.6		17.4	13.8
Memory work						4.7		5.6		3.6	4.4
Reading						8.8		14.1		14.6	13.6
Translation						15.3		8.6		10.6	10.7
Total						100.0		100.0		100.0	100.0
Spanish:											
Pronunciation						10.4		7.6		5.1	6.9
Grammar						17.6		14.7		15.1	15.5
Vocabulary						17.8		13.4		10.1	12.7
Oral work						20.8		18.1		26.9	23.1
Dictation						.5		4.3		3.7	3.1
Written work						9.9		12.8		14.0	12.7
Memory work						3.8		2.8		3.6	3.4
Reading						13.4		15.2		12.7	13.8
Translation						5.8		11.1		8.8	8.8
Total						100.0		100.0		100.0	100.0
Science:											
Earth	13.1			21.5	33.6	5.3	8.6	14.8	4.7	12.1	10.9
Air	14.9			7.1	7.6	26.6	7.4	15.4	22.0	2.5	14.1
Fire			100.0	14.3	9.0	10.6	3.5	5.3	7.9	1.9	6.2
Water	11.2			7.1	26.4	4.0	9.6	13.0	20.2	.5	12.4

* The figures given for French and Spanish apply to the whole of the seventh, eighth, and ninth grades rather than to Grades 7-2, 8-2, and 9-2.

TABLE XXVIII—*Continued*

	Grade										
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	All
Science—*Continued*											
Life on earth	57.1			28.6	8.7	15.7	16.3	11.7	8.8	30.3	16.3
Foods and nutrition	3.7			7.1	.5	6.0	5.6	10.8	15.9	8.0	9.5
Health and sanitation					12.3	11.2	14.4	6.0	8.7	14.4	10.5
Machines, work, and energy				14.3	1.9	20.6	34.6	23.0	11.8	30.3	20.1
Total	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Social studies:											
History:											
Early civilizations	60.8	2.6	39.5		8.5	.5	.5				4.7
Events leading to discovery of America	1.2	36.3	5.1	21.4	9.0	2.2	.5				3.7
Discovery of America	5.3	10.7	5.0	11.3	9.9	3.9	.4				3.0
Nations interested in discovery, exploration, and colonization	10.4	12.1	16.3	6.4	8.0	1.8	.9				2.9
Study of three type colonies	19.7		6.7		7.9	12.6	1.6				4.1
Intercolonial wars	1.2		7.1		8.2	1.7	.4				1.6
American Revolution		9.2	10.1	15.6	8.5	13.5	2.0				4.6
Critical period		2.1	2.0	3.2	7.4	3.9	5.0				2.4
Making the Constitution		.7	3.2	1.0	7.5	3.5	4.4				2.2
Starting the new government		2.3	1.8	1.0	5.5	5.4	3.8				2.2
National struggle for commercial independence	1.2		3.2	4.9	6.2	7.1	5.6				2.9
Industrial progress before Civil War		1.2		2.0	2.1	6.6	9.0	5.0			2.8
Slavery issue		5.1		5.8	5.1	6.2	10.8	2.2			3.4
Civil War		7.4		7.8	2.5	9.0	8.8	4.0			3.6
Period of reconstruction		.1		3.9		2.7	10.9	8.3			2.4
Industrial progress	.2	.9		3.9		4.8	8.8	19.2			3.2
Territorial growth		5.5		3.9	1.0	2.9	7.3	5.6			2.1
Transportation and communication		3.4		3.9	.7	1.7	9.8	3.0			2.1
Study of national issues		.2		2.0	1.7	4.5	3.0	27.1			3.1
International relations		.2		2.0	.3	5.5	6.5	25.6			3.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0			60.4

TABLE XXVIII—*Continued*

	Grade										
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	All
Social studies—*Continued*											
Community civics:											
Relations with other people	26.2	31.3	24.7	16.4	8.5	6.9	12.8	2.2	5.7	......	2.0
First community we know	13.1	23.3	14.0	8.2	7.0	......	8.0	1.1	4.5	......	1.2
Communities closely related to us	3.3	6.7	3.2	8.6	9.6	......	3.2	4.1	5.4	......	1.2
How communities grow	18.1	17.4	20.5	16.8	5.0	......	......	4.6	3.1	......	1.3
Political communities	4.9	4.0	5.0	3.1	2.9	.8	19.2	24.3	3.6	......	2.5
The citizen and his government	......	2.7	5.0	3.1	7.8	.4	15.3	2.1	5.5	......	1.1
Health	34.4	5.3	7.1	22.5	19.1	6.9	10.9	1.5	9.0	......	2.1
Protection of life and property	......	4.0	6.5	12.3	21.0	3.7	3.6	3.8	7.1	9.5	2.0
Education	......	4.0	2.4	......	.3	6.3	6.9	7.9	2.8	......	1.4
Recreation	......	1.3	1.3	1.0	3.7	6.7	2.4	2.0	4.7	3.6	.9
Community-planning	......	......	.6	1.0	2.1	6.5	2.4	3.6	8.6	5.9	1.3
Communication and transportation	......	......	4.3	1.0	......	19.5	3.6	9.7	2.9	2.5	1.5
Wealth (getting a living)	......	......	1.7	1.0	2.5	8.4	11.7	5.9	2.3	5.5	1.2
Care of the unfortunate	......	......	.6	1.0	1.4	10.5	......	3.2	4.6	12.5	1.2
Right living	......	......	.6	1.0	3.3	6.9	......	1.5	3.5	7.2	.9
American ideals about government	......	......	.6	1.0	2.2	7.4	......	4.2	7.6	12.4	1.5
How our laws are made and enforced	......	......	1.3	1.0	2.9	8.2	......	8.3	15.8	16.6	2.5
How the government is supported	......	......	.6	1.0	.7	.9	......	10.0	3.3	24.3	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	27.5
Vocational civics:											
General aims	......	......	33.0	......	9.7	......	10.6	......	......	11.1	.8
Specific aims	......	......	33.0	......	49.9	......	49.7	......	72.5	54.1	4.4
Topics	......	......	34.0	......	40.4	......	39.7	......	27.5	34.8	3.0
Total	......	......	100.0	......	100.0	......	100.0	......	100.0	100.0	8.2

TABLE XXVIII—*Continued*

	Grade										
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	All
Social studies—*Continued*											
Economic civics:											
Universality of labor	....	....	....	23.0	....	....	100.0	....	9.6	9.1	.5
Conditions limiting vocational choice	....	....	....	....	....	....	....	....	9.6	8.8	.3
Work and its importance	....	....	....	11.0	....	....	....	12.5	12.4	16.1	.5
Agencies of production	....	....	....	11.0	....	....	....	50.0	12.4	32.5	1.0
Modern economic organizations	....	....	....	11.0	....	....	....	....	16.4	....	.2
Government as an economic agency	....	....	....	....	....	....	....	....	6.8	3.3	.2
Modern economic problems	....	....	....	44.0	....	....	....	37.5	32.8	30.2	1.2
Total	....	....	....	100.0	....	....	100.0	100.0	100.0	100.0	3.9
Grand total for social studies	....	....	....	....	....	....	....	....	....	....	100.0

TABLE XXIX

Total Time Allotments of Each Unit of Teaching Distributed Proportionally to the Semesters*

	Grade										Total
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	
English (grammar):											
Sentence	5.9	5.4	18.3	7.9	25.2	11.2	3.8	2.0	7.8	12.5	100.0
Parts of speech	6.3	8.0	20.2	10.1	19.9	14.4	2.8	3.7	10.3	4.3	100.0
Nouns	1.7	.8	15.6	10.9	20.2	8.4	20.1	3.9	6.2	12.2	100.0
Pronouns	1.8	1.8	6.0	8.4	36.7	7.9	19.8	1.9	7.1	8.6	100.0
Adjectives	1.6	3.9	7.6	6.7	18.5	15.3	5.2	21.6	9.7	9.9	100.0
Adverbs	2.4		8.0	3.5	21.0	18.1	4.3	19.8	10.8	12.1	100.0
Prepositional phrases			6.6	12.5	15.4	31.3	7.9	5.0	7.6	13.7	100.0
Verbs	1.0		3.4	3.1	10.5	18.9	12.2	14.0	10.1	26.8	100.0
Clauses				4.3	2.1	31.7	9.0	26.3	13.7	12.9	100.0
Structures for varying expression					5.9	6.8	1.9	34.6	24.1	26.7	100.0
Geography:											
Local district	19.6	17.1	13.6	2.7	34.4	7.8	4.8				100.0
Life in the state	16.3	10.4	8.2	7.4	36.8	9.5	11.4				100.0
United States	32.4	11.0	14.7	19.8	9.5	8.8	3.8				100.0
World as a whole	20.8	25.6	9.1	18.6	14.6	7.4	3.9				100.0
Africa			20.5	44.1	17.1	18.3					100.0
Asia		1.1	18.7	42.6	13.4	24.2					100.0
Australia, etc.		12.7		32.8	17.3	37.2					100.0
Europe			46.7	22.2	23.1	8.0					100.0
North America other than United States	26.5	59.8	7.6	6.1							100.0
South America		53.6	31.5			14.9					100.0
General geography	18.0	7.6	14.3	7.6	26.7	14.3	11.5				100.0

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* The percentages were obtained as follows: (1) The total of all of the time allotments to a given unit of teaching was secured for each semester; the total for the first unit of teaching in grammar in Grade 5-1 is 1,056 minutes; in Grade 5-2, 961 minutes, etc. (2) The sum total of the ten semester totals was secured for each unit of teaching; the sum total for the first unit of teaching in grammar is 17,794 minutes; for the second, 18,765 minutes, etc. (3) The ratio of the total time allotment for a unit of teaching for a given semester to the sum total of the ten semester totals is the average proportional distribution of the total time allotment for the unit of teaching to the semester; the ratio of 1,056 minutes, the total time allotment for the first unit of teaching in grammar in Grade 5-1, to 17,794 minutes, the sum total of the ten semesters, is 5.9 per cent, which is the percentage of the total time allotment for the first unit of teaching in grammar used in Grade 5-1.

TABLE XXIX—*Continued*

	Grade										Total
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	
Health:											
Hygiene:											
Health habit formation	17.2	12.3	12.7	9.2	12.6	7.9	7.2	5.6	8.6	6.7	100.0
Health information	12.5	13.4	10.3	12.2	9.9	12.8	10.1	7.2	7.1	4.5	100.0
Health ideals	17.7	7.3	6.7	11.4	15.4	18.0	8.7	6.7	6.3	1.8	100.0
Attitude of individual responsibility	10.8	7.5	9.6	13.2	17.2	15.4	9.1	12.8	3.2	1.2	100.0
Physical education:											
Formal work	7.2	7.2	7.2	8.1	11.7	12.8	10.1	11.3	11.8	12.6	100.0
Swimming	10.0	10.0	10.0	10.0	4.0	16.5	......	12.5	7.2	19.8	100.0
Rhythmic work	11.1	11.1	11.1	13.6	7.7	11.0	6.0	9.3	7.9	11.2	100.0
Play and games	9.4	9.4	9.2	12.7	10.4	11.6	7.9	9.1	9.6	10.7	100.0
Highly organized games and athletics	6.1	6.1	6.1	8.7	11.7	14.0	11.0	11.0	13.8	11.5	100.0
Organized recess	11.1	11.1	11.1	11.0	9.3	9.3	9.3	9.3	9.3	9.2	100.0
Home economics:											
Home and family:											
Home	2.5	3.1	2.7	3.1	10.0	12.9	18.9	8.4	18.1	20.3	100.0
House	1.0	1.0	4.4	3.9	3.2	2.8	20.5	17.3	18.5	27.4	100.0
Family	1.8	1.8	2.0	3.3	4.1	6.9	5.2	10.6	34.9	29.4	100.0
Foods:											
Meal planning, etc.	.2	2.3	3.3	4.6	12.9	15.5	9.4	11.9	20.3	19.6	100.0
Food care, etc.	......	......	2.4	3.2	14.4	14.6	19.8	19.2	13.9	12.5	100.0
Food industries	......	......	2.8	2.6	15.0	10.5	16.2	6.1	33.7	13.1	100.0
Clothing:											
Ready-made articles, etc.	4.8	5.1	6.2	7.2	11.2	17.6	3.4	19.9	9.8	14.8	100.0
Care, repair, etc.	3.2	1.0	.6	1.9	24.8	9.9	30.0	6.3	7.2	15.1	100.0
Construction, etc.	5.3	4.2	2.2	3.3	9.9	7.3	11.3	8.3	21.3	26.9	100.0
Clothing industries	1.9	1.9	1.0	2.5	10.0	7.5	12.3	6.8	19.9	36.2	100.0

TABLE XXIX—*Continued*

	Grade										Total
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	
Latin:											
Vocabulary					3.0	5.9	14.1	14.8	31.8	30.4	100.0
Grammar					2.3	9.4	14.7	15.7	31.2	26.7	100.0
Forms					2.0	9.5	14.3	18.2	32.8	23.2	100.0
Latin to English (prepared)					2.9	7.2	9.3	12.5	33.5	34.6	100.0
Latin to English (sight)					.8	6.1	10.2	13.4	28.5	41.0	100.0
English to Latin (prepared)					3.2	8.1	11.7	13.3	31.0	32.7	100.0
English to Latin (sight)					.6	16.9	15.2	14.6	26.5	26.2	100.0
Relation of Latin to English					2.1	4.1	23.8	23.8	23.1	23.1	100.0
Relation to other foreign languages						4.0	24.0	24.0	22.0	26.0	100.0
Roman history					1.1	4.2	17.7	23.1	24.6	29.3	100.0
Mathematics:											
Arithmetic:											
Fundamental operations	26.5	25.0	18.2	7.7	10.3	6.2	2.3	2.0	1.8		100.0
Tables of weights and measures	13.5	15.4	26.3	23.3	6.2	4.1	2.4	7.1	1.7		100.0
Percentage	.5	2.1	9.5	23.9	21.1	21.8	8.6	10.1	2.3	.1	100.0
Mensuration	1.0	3.0	6.8	16.0	10.0	29.0	17.0	12.6	4.6		100.0
Social arithmetic	3.3	3.3	1.1	3.6	13.7	21.8	19.8	19.0	5.9	8.5	100.0
Intuitive geometry:											
Direct measurement					36.2	14.3	13.3	5.5	20.0	10.7	100.0
Mensuration					14.2	15.9	23.1	42.4	4.4		100.0
Indirect measurement					24.4	25.2	6.8	19.8	17.0	6.8	100.0
Geometric forms					20.3	19.5	21.5	27.4	5.6	5.7	100.0
Algebra:											
Formula					4.0	1.3	17.0	18.1	26.4	33.2	100.0
Graphic representation					9.9	4.7	8.8	6.2	38.4	32.0	100.0
Positive and negative numbers						1.6	2.0	7.2	56.3	32.9	100.0
Equations					.7	2.1	10.4	10.7	31.4	44.7	100.0
Algebraic technique						2.1	9.6	4.1	45.1	39.1	100.0
Numerical trigonometry								4.5	36.9	58.6	100.0

TABLE XXIX—*Continued*

	Grade										Total
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	
Modern languages:*											
French:											
Pronunciation	.....	.....	.....	.....	.....	20.0	.....	43.4	.....	36.6	100.0
Grammar	.....	.....	.....	.....	.....	9.7	.....	28.7	.....	61.6	100.0
Vocabulary	.....	.....	.....	.....	.....	27.6	.....	30.1	.....	42.3	100.0
Oral work	.....	.....	.....	.....	.....	10.6	.....	34.5	.....	54.9	100.0
Dictation	.....	.....	.....	.....	.....	17.6	.....	44.5	.....	37.9	100.0
Written work	.....	.....	.....	.....	.....	8.3	.....	24.6	.....	67.1	100.0
Memory work	.....	.....	.....	.....	.....	15.4	.....	41.0	.....	43.6	100.0
Reading	.....	.....	.....	.....	.....	9.3	.....	33.3	.....	57.4	100.0
Translation	.....	.....	.....	.....	.....	20.7	.....	26.1	.....	53.2	100.0
Spanish:											
Pronunciation	.....	.....	.....	.....	.....	33.9	.....	29.5	.....	36.6	100.0
Grammar	.....	.....	.....	.....	.....	25.5	.....	25.5	.....	49.0	100.0
Vocabulary	.....	.....	.....	.....	.....	31.5	.....	28.4	.....	40.1	100.0
Oral work	.....	.....	.....	.....	.....	20.2	.....	21.2	.....	58.6	100.0
Dictation	.....	.....	.....	.....	.....	3.9	.....	36.7	.....	59.4	100.0
Written work	.....	.....	.....	.....	.....	17.5	.....	27.3	.....	55.2	100.0
Memory work	.....	.....	.....	.....	.....	24.8	.....	22.3	.....	52.9	100.0
Reading	.....	.....	.....	.....	.....	22.3	.....	30.4	.....	47.3	100.0
Translation	.....	.....	.....	.....	.....	15.1	.....	34.5	.....	50.4	100.0
Science:											
Earth	2.5	.....	.....	3.2	25.8	4.9	12.3	17.6	13.1	20.6	100.0
Air	2.2	.....	.....	.8	4.6	19.1	8.2	14.2	47.5	3.4	100.0
Fire	.....	.....	1.9	3.8	12.2	17.4	8.8	11.2	39.0	5.7	100.0
Water	1.9	.....	.....	.9	17.9	3.3	12.1	13.6	49.6	.7	100.0
Life on earth	7.3	.....	.....	2.9	4.5	9.7	15.7	9.3	16.2	34.4	100.0
Foods and nutrition	.8	.....	.....	1.2	.4	6.4	9.3	14.9	51.3	15.7	100.0
Health and sanitation	.....	.....	.....	.....	9.8	10.8	21.5	7.4	25.1	25.4	100.0
Machines, work, and energy	.....	.....	.....	.1	.1	10.3	27.0	15.8	18.8	27.9	100.0

* The figures given for French and Spanish apply to the whole of the seventh, eighth, and ninth grades rather than to Grades 7-2, 8-2, and 9-2.

TABLE XXIX—*Continued*

	Grade										Total
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	
Social studies:											
History:											
Early civilizations	46.9	2.0	26.1	.....	21.9	1.8	1.3	.....	.....	.....	100.0
Events leading to discovery of America	1.1	35.6	4.2	18.6	29.5	9.4	1.6	.....	.....	.....	100.0
Discovery of America	6.4	13.1	5.2	12.2	40.5	20.8	1.8	.....	.....	.....	100.0
Nations interested in discovery, exploration, and colonization	13.0	15.2	17.4	7.1	33.8	9.8	3.7	.....	.....	.....	100.0
Study of three type colonies	17.6	.....	4.3	.....	23.7	49.6	4.8	.....	.....	.....	100.0
Intercolonial wars	2.7	.....	13.9	.....	62.8	17.3	3.3	.....	.....	.....	100.0
American Revolution	.....	7.3	6.8	10.9	22.6	47.0	5.4	.....	.....	.....	100.0
Critical period	.....	3.2	2.7	4.4	37.8	26.3	25.6	.....	.....	.....	100.0
Making the Constitution	.....	1.2	4.6	1.5	42.0	26.0	24.7	.....	.....	.....	100.0
Starting the new government	.....	3.8	4.0	1.4	30.5	39.4	20.9	.....	.....	.....	100.0
National struggle for commercial independence	1.5	.....	3.5	5.5	26.3	39.4	23.8	.....	.....	.....	100.0
Industrial progress before Civil War	.....	1.5	.....	2.2	8.9	37.4	38.8	11.2	.....	.....	100.0
Slavery issue	.....	5.4	.....	5.5	18.0	28.7	38.3	4.1	.....	.....	100.0
Civil War	.....	7.5	.....	7.0	8.4	40.3	29.8	7.0	.....	.....	100.0
Period of reconstruction	.....	2.0	.....	5.2	.....	18.1	54.7	20.0	.....	.....	100.0
Industrial progress	.4	1.0	.....	3.9	.....	23.6	33.3	37.8	.....	.....	100.0
Territorial growth	.....	9.4	.....	5.9	5.9	19.8	42.1	16.9	.....	.....	100.0
Transportation and communication	.....	6.3	.....	6.3	4.2	13.9	59.7	9.6	.....	.....	100.0
Study of national issues	.....	.3	.....	2.0	6.8	23.3	11.7	55.9	.....	.....	100.0
International relations	.....	.3	.....	1.8	1.2	25.9	23.4	47.4	.....	.....	100.0
Community civics:											
Relations with other people	8.4	12.3	12.0	8.4	12.3	7.5	10.0	7.5	21.6	.....	100.0
First community we know	6.8	14.7	11.0	6.8	16.5	.....	10.2	6.2	27.8	.....	100.0
Communities closely related to us	1.7	4.4	2.6	7.3	23.1	.....	4.2	23.0	33.7	.....	100.0
How communities grow	8.8	10.4	15.2	13.1	11.0	.....	.....	23.6	17.9	.....	100.0
Political communities	1.3	1.3	1.9	1.3	3.4	.7	12.2	66.8	11.1	.....	100.0
The citizen and his government	.....	1.8	4.2	2.8	19.9	.7	21.2	12.3	37.1	.....	100.0

TABLE XXIX—*Continued*

	Grade										Total
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2	
Social studies: Community civics—*Continued*											
Health	10.3	2.0	3.2	6.9	25.9	7.0	8.0	4.9	31.8		100.0
Protection of life and property		1.5	3.1	6.2	29.7	4.0	2.8	12.6	26.3	13.8	100.0
Education		2.2	1.7		25.1	.6	9.8	7.7	52.9		100.0
Recreation		1.1	1.3	1.1	11.5	15.8	4.1	14.7	39.0	11.4	100.0
Community-planning			.5	.8	4.7	10.7	2.8	18.3	49.0	13.2	100.0
Communication and transportation			2.8	.7		28.7	3.8	44.3	14.6	5.1	100.0
Wealth (getting a living)			1.4	.7	6.1	15.3	15.3	33.1	14.6	13.5	100.0
Care of the unfortunate			.4	1.0	3.4	18.8		17.7	28.5	30.2	100.0
Right living			.7	1.2	11.4	17.8		12.4	31.1	25.4	100.0
American ideals about government			.2	1.0	4.3	11.0		19.1	39.3	25.1	100.0
How our laws are made and enforced			.5	.4	3.3	7.1		22.2	47.2	19.3	100.0
How the government is supported			.4	.6	1.2	1.1		39.7	14.9	42.1	100.0
Vocational civics:											
General aims			3.9		23.6		33.6			38.9	100.0
Specific aims			.8		21.7		28.3		15.1	34.1	100.0
Topics			1.0		25.8		32.9		8.3	32.0	100.0
Economic civics:											
Universality of labor				5.0			24.0		29.4	41.6	100.0
Conditions limiting vocational choice									42.4	57.6	100.0
Work and its importance				2.0				9.6	30.2	58.2	100.0
Agencies of production				1.1				20.4	16.0	62.5	100.0
Modern economic organizations				4.7					95.3		100.0
Government as an economic agency									58.3	41.7	100.0
Modern economic problems				3.5				13.0	35.1	48.4	100.0

TABLE XXX

Variations in Practice*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
English (grammar):										
Sentence	5 315 46	5 210 43	8 725 87	5 669 27	9 1,350 43	5 880 30	5 310 17	2 320 19	6 615 58	6 1,205 75
Parts of speech	4 760 18	4 736 11	11 765 98	6 765 81	8 1,030 56	3 1,700 92	4 330 18	3 580 98	7 205 65	6 225 19
Nouns	2 15 23	1	5 300 74	4 170 41	7 485 31	3 33 8	5 1,170 47	3 175 40	5 75 10	5 300 19
Pronouns	1	1	2 120 3	4 280 87	7 1,280 55	4 240 15	5 1,100 44	2 80 4	5 50 12	6 145 13
Adjectives	1	1	4 95 11	4 60 22	5 375 9	4 340 36	3 120 16	3 690 29	4 160 6	5 75 4
Adverbs	1	....	4 85 10	2 65 1	5 375 11	5 350 38	3 58 9	3 457 18	5 80 1	5 81 4
Prepositional phrases	....	....	4 165 8	7 190 20	5 470 23	6 995 49	4 240 31	2 205 8	5 140 13	7 207 16

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* The first figure in each case is the number of centers giving instruction in the unit of teaching; the second figure is the difference in minutes between the highest and the lowest semester time allotments; the third figure is the difference between the highest and the lowest proportional time allotments of the semester to the unit of teaching.

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
English (grammar)—*Continued*										
Verbs	1	....	2 270 11	2 310 8	4 800 26	5 1,580 63	5 608 81	5 810 72	8 265 18	9 1,710 67
Clauses	....	....	....	1	2 0 1	6 1,300 79	4 355 31	7 975 97	8 190 30	7 286 24
Structures for varying expression	....	....	....	....	3 130 57	2 170 8	2 58 8	7 577 50	8 193 69	10 320 41
Geography:										
Local district	4 690 30	3 690 30	3 549 19	2 22 0	3 875 21	2 102 0	2 110 5	....	....	....
Life in the state	5 690 30	3 690 30	3 549 19	2 514 15	5 550 43	2 90 31	2 470 17	....	....	....
United States	8 4,348 96	6 1,048 46	6 2,359 98	6 2,940 97	3 1,750 25	3 806 47	2 280 0	....	....	....
World as a whole	6 2,412 84	6 2,600 84	4 2,040 24	7 3,300 61	4 3,840 73	4 1,152 68	2 330 0	....	....	....
Africa	....	....	3 578 23	3 1,175 25	2 270 20	1	....	....	....	....

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Geography—*Continued*										
Asia	......	1	2	4	2	2	......	......	......	......
	......	......	252	1,875	30	1,750	......	......	......	......
	......	......	33	38	13	39	......	......	......	......
Australia, etc.	......	1	......	4	2	2	......	......	......	......
	......	......	......	825	510	370	......	......	......	......
	......	......	......	17	27	5	......	......	......	......
Europe	......	......	5	5	2	1	......	......	......	......
	......	......	4,375	1,750	3,960	......	......	......	......	......
	......	......	55	84	60	......	......	......	......	......
North America other than United States	3	4	1	1	......	......	......	......	......	......
	1,750	2,160	......	......	......	......	......	......	......	......
	74	42	......	......	......	......	......	......	......	......
South America	......	4	2	......	......	1	......	......	......	......
	......	1,873	925	......	......	......	......	......	......	......
	......	43	43	......	......	......	......	......	......	......
General geography	3	1	3	1	3	1	2	......	......	......
	800	......	1,250	......	4,280	......	1,390	......	......	......
	50	......	75	......	80	......	22	......	......	......
Health:										
Hygiene:										
Health habit formation	11	7	8	6	10	8	7	7	7	6
	1,330	1,330	1,330	1,330	1,537	1,537	1,537	1,537	1,537	1,537
	87	87	94	94	91	37	94	40	71	88
Health information	6	7	5	5	9	10	8	8	8	5
	1,055	1,055	1,305	1,305	1,368	738	1,368	738	1,368	278
	42	73	40	73	57	99	99	77	99	24

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Health: Hygiene—*Continued*										
Health ideals	5 355 22	4 85 7	3 65 7	6 225 47	5 430 11	5 444 34	5 105 6	4 105 6	4 90 12	2 15 6
Attitude of individual responsibility	6 435 24	5 71 7	5 71 47	6 211 47	6 680 18	5 680 18	5 210 11	5 320 41	2 80 4	2 0 9
Physical education:										
Formal work	9 1,028 22	9 1,028 22	9 1,028 22	10 1,028 22	13 1,680 59	14 1,680 59	10 1,545 55	11 1,545 55	12 1,575 95	12 1,545 58
Swimming	1	1	1	1	1	2 685 11	....	1	1	2 420 12
Rhythmic work	10 964 49	10 964 49	10 964 49	11 964 49	9 870 25	10 1,164 25	6 870 25	7 1,164 25	9 870 25	9 1,164 25
Play and games	9 715 21	9 715 21	9 715 21	10 1,315 30	11 1,155 29	12 1,155 29	8 1,155 16	9 1,155 18	10 1,155 32	11 1,155 32
Highly organized games and athletics	6 1,053 34	6 1,053 34	6 1,053 34	7 1,243 34	10 770 18	11 850 17	8 770 18	9 850 17	9 835 18	10 835 17
Organized recess	3 413 21	3 413 21	3 413 21	3 413 21	2 1,505 13	2 1,505 13	2 1,505 13	2 1,505 13	2 1,505 13	2 1,505 13

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Home economics:										
Home and family:										
Home	2 0 60	2 120 60	3 300 88	3 260 88	5 800 75	5 800 64	4 2,075 67	4 360 25	6 1,770 47	7 1,770 41
House	1	1	2 440 30	1	3 190 25	2 150 8	3 1,400 67	2 1,400 67	5 900 25	7 1,010 32
Family	1	1	2 140 9	2 40 75	3 440 16	4 400 89	3 296 80	3 160 36	7 1,040 66	7 1,696 91
Foods:										
Meal planning, etc.	1	2 1,110 0	5 1,313 30	5 1,260 40	8 2,400 73	9 3,020 40	7 1,600 79	8 3,020 83	9 4,730 84	8 4,730 84
Food care, etc.	....	....	2 47 5	3 280 29	6 700 8	6 700 11	8 836 95	7 836 72	7 320 20	6 580 18
Food industries	....	....	2 80 11	2 60 1	6 400 18	5 445 18	4 300 11	2 200 8	6 1,800 46	5 200 15
Clothing:										
Ready-made articles, etc.	3 525 96	2 624 96	2 800 92	3 800 95	3 1,100 95	3 2,140 94	3 348 11	4 2,375 96	7 410 15	8 700 18
Care, repair, etc.	3 195 25	1	1	2 230 2	4 4,016 78	4 690 33	6 4,216 89	3 1,095 35	5 450 13	9 700 16

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Home economics: Clothing—*Continued*										
Construction, etc.	4 1,200 33	3 840 20	2 600 25	2 1,740 5	6 2,370 67	5 2,010 67	7 2,948 99	5 1,908 62	9 2,900 62	12 2,900 62
Clothing industries	1	1	1	2 65 4	4 100 7	3 100 7	5 300 8	3 300 8	6 560 16	8 560 19
Latin:*										
Vocabulary	....	....	....	....	1	3 10	6 27	7 12	13 23	13 25
Grammar	....	....	....	....	1	4 12	7 16	8 15	12 21	12 21
Forms	....	....	....	....	1	4 5	6 21	8 24	13 23	13 23
Latin to English (prepared)	....	....	....	....	1	4 19	5 10	6 10	13 22	13 24
Latin to English (sight)	....	....	....	....	1	4 17	7 18	8 18	12 25	13 36

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* In the special Latin questionnaire the time allotment was based on the daily schedule instead of the weekly schedule as in the case of the other subjects. The different basis does not provide figures that may be compared readily. The second row of figures is omitted, therefore, in the case of Latin. The degree of variation, however, is shown by the difference in proportional time allotments.

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Latin—*Continued*										
English to Latin (prepared)	....	....	....	....	1	3 10	4 20	5 20	12 21	12 16
English to Latin (sight)	....	....	....	....	1	4 27	5 27	5 27	10 16	10 16
Relation of Latin to English	....	....	....	....	1	4 6	7 44	8 44	13 8	13 8
Relation to other foreign languages	....	....	....	....	....	1	4 4	4 4	6 2	5 3
Roman history	....	....	....	....	1	3 3	6 17	7 17	10 7	10 8
Mathematics:										
Arithmetic:										
Fundamental operations	14 3,950 60	14 3,475 62	14 3,800 80	10 1,275 62	12 2,290 55	12 1,600 31	4 280 69	5 640 41	2 120 41	....
Tables of weights and measures	9 1,595 30	10 1,350 28	11 2,900 58	11 2,900 58	5 2,090 49	8 415 12	4 775 35	6 1,850 95	1	....
Percentage	2 200 8	3 1,157 30	8 1,600 43	13 2,300 68	11 1,400 42	11 2,350 86	4 2,550 64	6 2,650 25	2 870 11	1 ....

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Mathematics: Arithmetic—*Continued*										
Mensuration	2 20 2	2 283 6	3 875 25	7 525 20	5 1,020 73	10 1,920 50	3 2,150 48	3 680 22	1	....
Social arithmetic	3 925 45	4 750 37	3 200 5	5 550 18	7 1,450 44	12 2,200 56	8 2,025 94	8 1,975 53	1	1 ....
Intuitive geometry:										
Direct measurement	....	....	....	....	5 920 36	2 455 6	2 200 4	1	3 720 49	2 295 50
Mensuration	....	....	....	....	2 1,520 37	3 740 49	4 900 49	5 1,115 83	1	....
Indirect measurement	....	....	....	....	2 690 63	2 560 60	3 240 13	3 745 33	2 130 2	2 165 13
Geometric forms	....	....	....	....	4 1,270 45	4 1,320 40	4 1,410 46	5 2,800 90	2 252 24	3 325 30
Algebra:										
Formula	....	....	....	....	1	1	4 800 44	5 915 92	9 830 20	8 1,425 34
Graphic representation	....	....	....	....	1	2 25 66	3 300 90	2 350 11	7 1,240 36	7 1,020 25

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Mathematics: Algebra—*Continued*										
Positive and negative numbers	......	......	......	......	......	1	1	2	12	3
	......	......	......	......	......	......	......	325	855	840
	......	......	......	......	......	......	......	39	14	29
Equations	......	......	......	......	1	2	5	4	11	12
	......	......	......	......	......	40	900	575	1,788	2,150
	......	......	......	......	......	40	84	26	56	35
Algebraic technique	......	......	......	......	......	1	3	4	12	12
	......	......	......	......	......	......	1,900	525	2,190	1,990
	......	......	......	......	......	......	49	39	53	50
Numerical trigonometry	......	......	......	......	......	......	......	1	2	3
	......	......	......	......	......	......	......	......	320	320
	......	......	......	......	......	......	......	......	9	9
Modern languages:*										
French:										
Pronunciation	......	......	......	......	......	4	......	8	......	12
	......	......	......	......	......	1,215	......	2,075	......	1,331
	......	......	......	......	......	9	......	16	......	21
Grammar	......	......	......	......	......	3	......	8	......	12
	......	......	......	......	......	635	......	2,385	......	2,915
	......	......	......	......	......	15	......	24	......	23
Vocabulary	......	......	......	......	......	4	......	8	......	12
	......	......	......	......	......	750	......	1,550	......	1,406
	......	......	......	......	......	5	......	11	......	13

* The figures given for French and Spanish apply to the whole of the seventh, eighth, and ninth grades rather than to Grades 7-2, 8-2, and 9-2.

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Modern languages: French—*Continued*										
Oral work	......	......	......	......	......	3	......	8	......	12
	......	......	......	......	......	700	......	2,155	......	815
	......	......	......	......	......	15	......	15	......	40
Dictation	......	......	......	......	......	2	......	7	......	9
	......	......	......	......	......	1,050	......	1,150	......	750
	......	......	......	......	......	11	......	12	......	8
Written work	......	......	......	......	......	3	......	7	......	12
	......	......	......	......	......	230	......	1,120	......	2,320
	......	......	......	......	......	10	......	9	......	14
Memory work	......	......	......	......	......	4	......	7	......	8
	......	......	......	......	......	705	......	1,465	......	1,317
	......	......	......	......	......	8	......	14	......	11
Reading	......	......	......	......	......	3	......	7	......	11
	......	......	......	......	......	1,310	......	2,020	......	2,100
	......	......	......	......	......	11	......	21	......	28
Translation	......	......	......	......	......	3	......	5	......	9
	......	......	......	......	......	2,600	......	2,030	......	2,200
	......	......	......	......	......	25	......	19	......	17
Spanish:										
Pronunciation	......	......	......	......	......	5	......	4	......	7
	......	......	......	......	......	1,300	......	180	......	850
	......	......	......	......	......	9	......	2	......	8
Grammar	......	......	......	......	......	4	......	4	......	6
	......	......	......	......	......	1,800	......	1,892	......	1,500
	......	......	......	......	......	37	......	23	......	16

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Modern languages: Spanish—*Continued*										
Vocabulary	....	....	....	....	....	5 2,010 27	....	4 540 6	....	8 1,880 16
Oral work	....	....	....	....	....	4 1,700 12	....	5 1,680 26	....	8 4,020 50
Dictation	....	....	....	....	....	1	....	4 400 34	....	6 520 9
Written work	....	....	....	....	....	3 1,000 5	....	5 946 22	....	8 1,840 9
Memory work	....	....	....	....	....	2 590 3	....	4 98 2	....	6 340 10
Reading	....	....	....	....	....	4 2,210 21	....	4 1,732 18	....	8 2,000 28
Translation	....	....	....	....	....	2 300 4	....	3 1,742 16	....	5 1,840 14
Science:										
Earth	2 251 22	....	....	1	4 1,840 90	2 590 13	4 480 27	4 960 25	5 595 18	5 675 16

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Science—*Continued*										
Air	2	......	......	1	2	4	3	4	8	3
	202	......	......	......	86	1,980	212	780	2,572	410
	18	......	......	......	8	45	13	47	37	9
Fire	......	......	1	2	2	2	3	3	7	1
	......	......	......	1,200	70	420	42	160	660	......
	......	......	......	43	2	26	10	10	14	......
Water	1	......	......	1	2	1	4	4	7	2
	......	......	......	......	1,950	......	480	600	1,870	555
	......	......	......	......	38	......	10	36	12	14
Life on earth	2	......	......	1	1	2	4	5	5	7
	952	......	......	......	......	470	1,380	740	1,695	1,640
	58	......	......	......	......	53	21	17	38	42
Foods and nutrition	1	......	......	1	1	3	3	3	6	5
	......	......	......	......	......	320	340	1,020	2,160	475
	......	......	......	......	......	13	5	21	16	10
Health and sanitation	......	......	......	......	3	5	4	5	6	6
	......	......	......	......	540	510	1,380	304	760	1,140
	......	......	......	......	10	20	64	7	72	97
Machine, work, and energy	......	......	......	1	1	3	5	3	6	6
	......	......	......	......	......	1,236	2,560	2,152	1,230	1,790
	......	......	......	......	......	61	60	40	23	53
Social studies:										
History:										
Early civilizations	2	1	2	......	3	1	1	......	......	......
	150	......	1,070	......	1,105	......	......	......	......	......
	0	......	16	......	42	......	......	......	......	......

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Social studies: History—*Continued*										
Events leading to discovery of America	1	3	1	2	7	3	1	......	......	......
	......	1,995	......	1,105	524	220	......	......	......	......
	......	49	......	15	24	5	......	......	......	......
Discovery of America	2	3	2	2	7	3	1	......	......	......
	340	570	130	630	435	1,100	......	......	......	......
	15	14	13	12	15	27	......	......	......	......
Nations interested in discovery, exploration, and colonization	2	1	2	2	7	2	1	......	......	......
	300	......	545	10	390	320	......	......	......	......
	6	......	45	27	19	9	......	......	......	......
Study of three type colonies	2	......	1	......	5	4	1	......	......	......
	100	......	......	......	530	960	......	......	......	......
	31	......	......	......	15	37	......	......	......	......
Intercolonial wars	1	......	2	......	6	4	1	......	......	......
	......	......	225	......	435	80	......	......	......	......
	......	......	19	......	29	1	......	......	......	......
American Revolution	......	1	1	1	4	6	1	......	......	......
	......	......	......	......	570	615	......	......	......	......
	......	......	......	......	9	32	......	......	......	......
Critical period	......	1	1	1	5	4	3	......	......	......
	......	......	......	......	635	372	720	......	......	......
	......	......	......	......	16	20	15	......	......	......
Making the Constitution	......	1	1	1	5	4	3	......	......	......
	......	......	......	......	500	146	300	......	......	......
	......	......	......	......	11	11	5	......	......	......

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Social studies: History—*Continued*										
Starting the new government	......	1	1	1	3	5	4	......	......	......
	......	......	......	......	500	820	240	......	......	......
	......	......	......	......	14	14	6	......	......	......
National struggle for commercial independence	1	......	1	1	3	5	5	......	......	......
	......	......	......	......	760	730	160	......	......	......
	......	......	......	......	15	11	6	......	......	......
Industrial progress before Civil War	......	1	......	1	1	4	5	1	......	......
	......	......	......	......	......	250	1,176	......	......	......
	......	......	......	......	......	8	26	......	......	......
Slavery issue	......	2	......	1	2	4	6	1	......	......
	......	160	......	......	525	700	540	......	......	......
	......	14	......	......	15	15	19	......	......	......
Civil War	......	2	......	1	1	4	6	2	......	......
	......	360	......	......	......	500	420	199	......	......
	......	27	......	......	......	22	12	3	......	......
Period of reconstruction	......	1	......	1	......	3	7	3	......	......
	......	......	......	......	......	400	835	653	......	......
	......	......	......	......	......	8	18	30	......	......
Industrial progress	1	1	......	1	......	3	6	4	......	......
	......	......	......	......	......	900	695	372	......	......
	......	......	......	......	......	14	8	41	......	......
Territorial growth	......	2	......	1	1	4	7	3	......	......
	......	275	......	......	......	120	390	190	......	......
	......	21	......	......	......	12	16	11	......	......

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Social studies: History—*Continued*										
Transportation and communication		2		1	1	3	8	1		
		100				175	640			
		9				2	13			
Study of national issues		1		1	1	3	2	6		
						220	640	2,400		
						20	1	62		
International relations		1		1	1	3	4	6		
						400	890	1,744		
						15	11	35		
Community civics:										
Relations with other people	1	3	4	1	5	1	1	2	5	
		375	375		190			60	371	
		44	29		14			9	6	
First community we know	1	3	3	1	5		1	2	5	
		125	175		175			16	371	
		31	9		16			2	6	
Communities closely related to us	1	2	2	2	5		1	2	5	
		25	25	110	190			262	371	
		14	6	45	21			21	6	
How communities grow	2	2	4	2	4			2	4	
	225	175	225	90	125			438	110	
	25	6	14	25	15			29	3	
Political communities	2	2	4	2	2	1	1	4	4	
	25	25	35	25	100			2,030	130	
	45	1	8	2	2			43	4	

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Social studies: Community civics—*Continued*										
The citizen and his government	......	1	3	1	3	1	2	2	5	......
	......	......	60	......	140	......	25	166	246	......
	......	......	12	......	12	......	21	1	5	......
Health	3	2	3	2	5	1	2	1	5	......
	275	0	65	250	390	......	190	......	340	......
	95	28	10	38	37	......	1	......	5	......
Protection of life and property	......	2	3	1	3	2	1	3	5	1
	......	25	50	......	650	75	......	150	534	......
	......	27	2	......	16	11	......	3	9	......
Education	......	2	2	......	3	1	2	2	5	......
	......	25	5	......	430	......	150	40	400	......
	......	28	6	......	9	......	7	1	5	......
Recreation	......	1	1	1	2	1	1	3	5	1
	......	......	......	......	105	......	......	95	130	......
	......	......	......	......	9	......	......	1	4	......
Community-planning	......	......	1	1	1	2	1	3	5	1
	......	......	......	......	......	160	......	215	296	......
	......	......	......	......	......	1	......	7	6	......
Communication and transportation	......	......	2	1	......	2	1	3	3	1
	......	......	50	......	......	480	......	675	80	......
	......	......	7	......	......	6	......	22	1	......
Wealth (getting a living)	......	......	2	1	1	2	1	3	2	2
	......	......	10	......	......	360	......	320	180	60
	......	......	2	......	......	9	......	7	1	13

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Social studies: Community civics—*Continued*										
Care of the unfortunate	......	......	1	1	1	2	......	4	3	4
	......	......	......	......	......	50	......	125	296	201
	......	......	......	......	......	88	......	58	3	12
Right living	......	......	1	1	2	2	......	1	3	2
	......	......	......	......	120	240	......	......	70	243
	......	......	......	......	2	4	......	......	4	8
American ideals about government	......	......	1	1	1	2	......	2	5	2
	......	......	......	......	......	115	......	435	236	216
	......	......	......	......	......	7	......	6	6	16
How our laws are made and enforced	......	......	1	1	1	2	......	2	5	2
	......	......	......	......	......	70	......	150	700	172
	......	......	......	......	......	12	......	2	15	25
How the government is supported	......	......	1	1	1	1	......	5	2	4
	......	......	......	......	......	......	......	410	192	453
	......	......	......	......	......	......	......	91	4	30
Vocational civics:										
General aims	......	......	1	......	1	......	2	......	......	3
	......	......	......	......	......	......	240	......	......	340
	......	......	......	......	......	......	4	......	......	11
Specific aims	......	......	1	......	1	......	2	......	1	3
	......	......	......	......	......	......	1,630	......	......	1,810
	......	......	......	......	......	......	1	......	......	32
Topics	......	......	1	......	1	......	2	......	1	2
	......	......	......	......	......	......	1,350	......	......	1,420
	......	......	......	......	......	......	3	......	......	3

TABLE XXX—*Continued*

	Grade									
	5-1	5-2	6-1	6-2	7-1	7-2	8-1	8-2	9-1	9-2
Social studies—*Continued*										
Economic civics:										
Universality of labor	......	......	......	1	......	......	1	......	1	2
	......	......	......	......	......	......	......	......	......	85
	......	......	......	......	......	......	......	......	......	3
Conditions limiting vocational choice	......	......	......	......	......	......	......	......	1	1
	......	......	......	......	......	......	......	......	......	......
	......	......	......	......	......	......	......	......	......	......
Work and its importance	......	......	......	1	......	......	......	1	1	2
	......	......	......	......	......	......	......	......	......	70
	......	......	......	......	......	......	......	......	......	2
Agencies of production	......	......	......	1	......	......	......	1	1	2
	......	......	......	......	......	......	......	......	......	175
	......	......	......	......	......	......	......	......	......	12
Modern economic organizations	......	......	......	1	......	......	......	......	1	......
	......	......	......	......	......	......	......	......	......	......
	......	......	......	......	......	......	......	......	......	......
Government as an economic agency	......	......	......	......	......	......	......	......	1	1
	......	......	......	......	......	......	......	......	......	......
	......	......	......	......	......	......	......	......	......	......
Modern economic problems	......	......	......	1	......	......	......	1	1	2
	......	......	......	......	......	......	......	......	......	275
	......	......	......	......	......	......	......	......	......	16

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